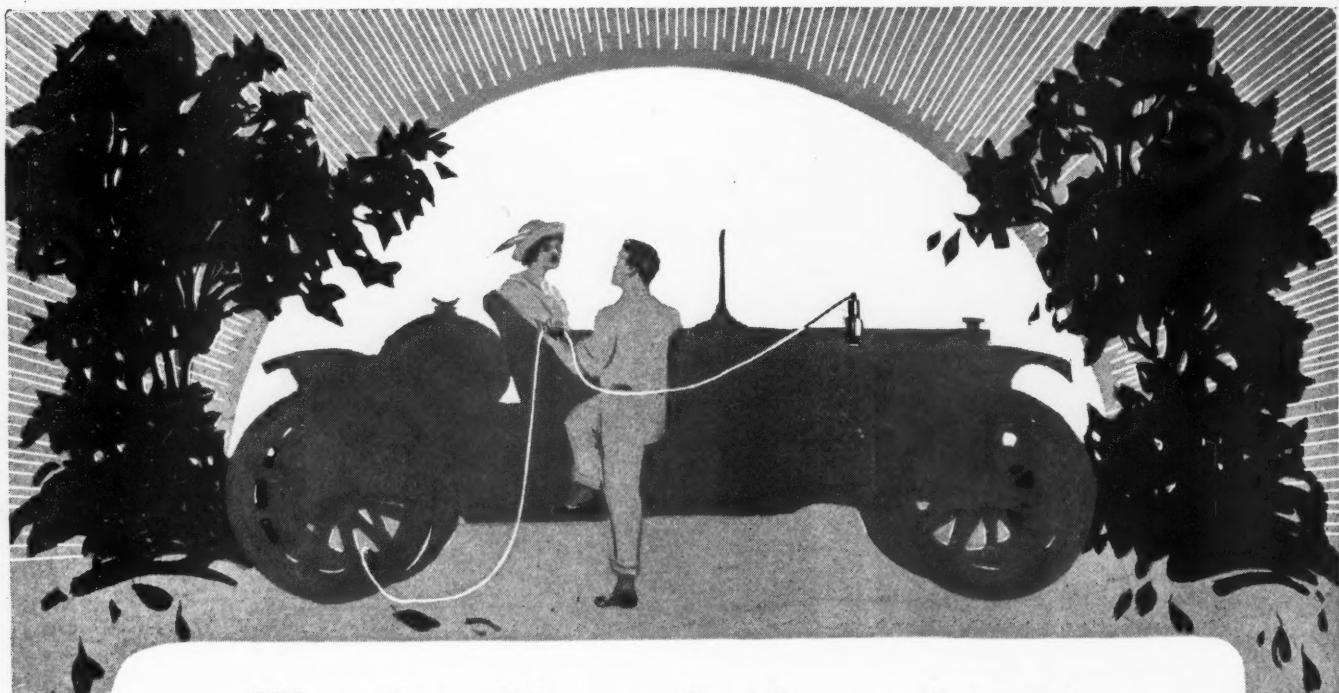


MOTOR AGE

August 7, 1913

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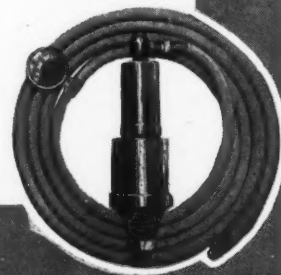
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June 25. 13.

New Departure Mfg. Co.,

Bristol, Conn.

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Am sending you by today's parcel post N. D. Bearings #210 and #307. It might be of interest to you to know the service your New Departure bearings have given. The two bearings are used on the front and rear of the transmission on a Model 16 Buick, 1910. The car has been driven a hundred and twenty-three thousand miles without a minute's trouble with the transmission and as you can see, the bearings are worn but very little, and the bronze bearing that supports the front of the main shaft was entirely gone, and this threw all the strain on the #307 bearing.

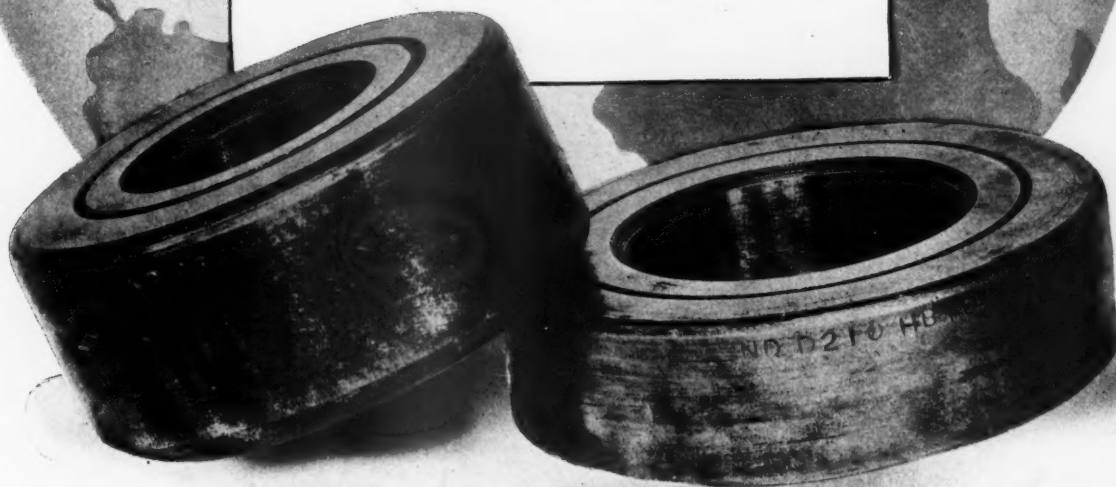
I think the N. D. Bearings would run some time yet but as I am overhauling the car, I thought it best to have them reinspected.

Thanking you for your prompt attention, I remain

Yours truly,

J. M. Carter Jr.

Foreman, Fulwiler's Garage.



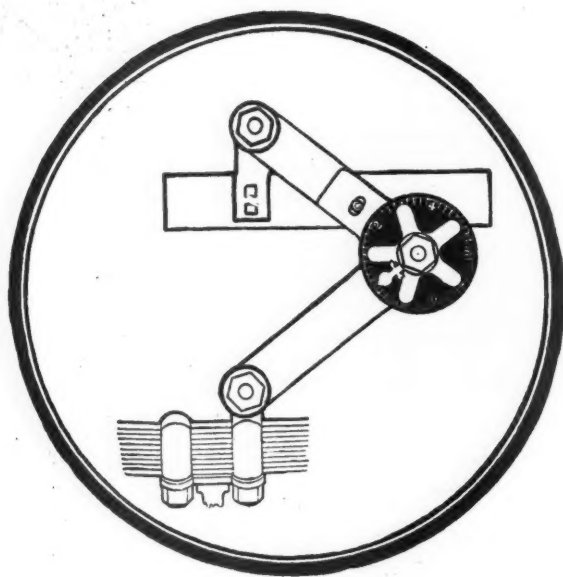
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MOTOR AGE



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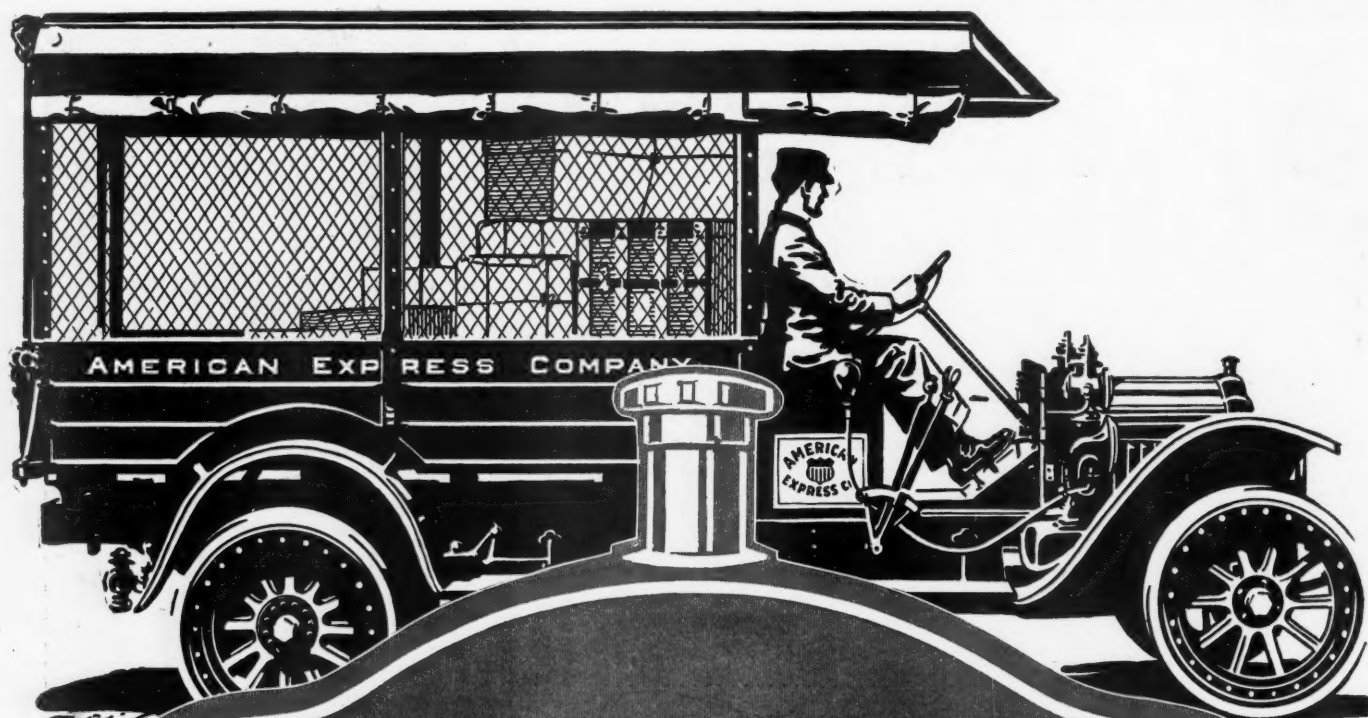
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MOTOR AGE

A Promise of the Future



What the Indiana-Pacific Tour Means to the Lincoln Trans-continental Highway Movement

By Darwin S. Hatch

TO the four great western states, Colorado, Utah, Nevada and California, through which the Hoosier tour passed, on its way to the Pacific coast, ending at Los Angeles last Monday, the Indiana cars appeared as heralds bringing promise of a great highway which would stretch in an unbroken concrete ribbon from the Atlantic to the Pacific.

Hold Highway Established

The peoples of these commonwealths toward the setting sun view the Lincoln highway project as an established fact; to them the tour simply was a pathfinding expedition whose sole object was the determination of a route which in a few months will be graded and surfaced with cement to become the one great continuous motor boulevard across the continent.

All along the route of the Hoosier tour road enthusiasm was at fever heat; every stretch of road had been dignified by some special name; and every mile

through the more thickly settled portions proudly bore its special colors so that it could not be mistaken. Every town and hamlet was decorated with the yellow strip of the Golden Belt, the gold and black of the Midland trail, the green and white of El Camino Sierra or the distinctive colors of the others. Lunchones and good roads speeches were in order at every cross-roads hamlet and, serving at the banquets which were the rule at each night stop, the beauties of the countryside were decorated with the colors of the road which the town was boosting.

Road Enthusiasm in West

These were only the outward evidences of an enthusiasm which found practical if less spectacular expression in an amazing amount of improvement in the roads

themselves. Evidences of newly completed road work were met every few miles, most of the way, and in many instances crews were at work as the tour passed. An inspiring sign of the permanence of the good roads enthusiasm was the fact that before the dust of the last car had settled, the men were at work again. This applied not only to Colorado's convicts but to her freeborn citizens as well.

But the germ of good roads had spread. Those along the projected route of the tour were not the only ones to bend their efforts toward making a showing. At every one of the larger towns there were delegations of citizens from towns 50 to 100 miles off the route, armed with figures as to the work they had done and pleading that the tour give their city and route a visit to prove how much better the roads than those in the original itinerary. In one or two instances, the feeling between exponents of the rival routes became so strong that revolver duels narrowly were averted.

Lincoln Route Not Settled

Many, perhaps most, of those beyond the Rocky mountains firmly believe that the mere passing of the I. A. M. A. tour over certain roads established definitely the final route of the Lincoln highway, and those sections traversed by the tour are consequently jubilant, just as those sections not so favored are either cast down or angry.

But the exact route of the proposed Lincoln highway which is to link two oceans across 5,000 miles of prairie, mountain and desert is far from settled with any degree of exactness. It is possible that none of the roads covered by the tour will be on the route finally decided upon. Most of the way from Kansas City west the Hoosier tourists traversed the Midland trail which crosses the Rockies over Berthoud pass, follows the Grand river to the Utah line, then across the desert to Salt Lake City, around the lower end of Great Salt Lake and across the southern end of the Great Salt Lake desert through Nevada via Ely, Tonopah and Goldfield to its end at Big Pine, Calif. There El Camino Sierra is picked up. This is the trail that runs along the east slope of the Sierra mountains from Los Angeles to Carson City and Reno. From there a projection of the California state highway offers a fine road to Oakland and San Francisco.

But there are at least three other main routes which are contestants for official sanction as the Lincoln highway. These are the Overland trail through southern Nebraska and Wyoming, cutting out Denver and joining the Midland trail at Salt Lake City, the Santa Fe trail from Kansas City to Pueblo and connecting with the Midland trail at Denver via the Golden Belt route; then there is the Northwestern trail from Minneapolis, traversing the northern tier of states and reach-

ing an arm of the Pacific at Seattle. A fifth optional route is the combination of the Southern route through Texas, to El Paso, where it joins the Borderland route through New Mexico and Arizona and running to Los Angeles on the Trail to Sunset.

History of the Lincoln memorial transcontinental highway is one of mushroom growth. Less than a year ago Carl G. Fisher, of the Prest-O-Lite Co., Indianapolis, conceived the idea of a great transcontinental highway from New York to the Golden Gate, a permanent road to be bridged, graded and prepared for surfacing by the counties and states along the route and then to be surfaced with concrete so that the cost of maintenance would be practically nil. It was estimated that such a surface, together with assistance in the preparation of the roadbed where the population was too sparse to bear the whole burden would cost \$10,000,000. At a banquet in Indianapolis, Fisher unfolded his plans to the motor car manufacturers, and that evening over \$300,000 was raised toward the fund. At the present time \$5,000,000 has been subscribed by car and accessory manufacturers and individuals throughout the country. The manufacturers are pledging 1 per cent of their gross yearly business as their subscription.

The plan for the Lincoln highway at present is that if the counties along a definite route from coast to coast will prepare the roadbed, attend to the grading, drainage, bridges and culverts, the Lincoln Highway Association will give \$5,000 per mile for a concrete surface. The preparation of the roadbed by the counties is to be under the supervision of highway engineers appointed by the government and the concrete surface will not be applied until the road is passed by them. The reason for this regulation is to assure that the low maintenance cost obtained by the concrete surface will not be increased by poor preparation of the roadbed. The maintenance cost with the concrete surface is expected to be not over \$4 per mile a year.

Route Decided Next Year

The commission which will make the final decision in the routing of the great highway has not been appointed but will be before the first of the year. As tentatively outlined at present the transcontinental road will not touch any of the motor car manufacturing centers. It will not come within 50 miles of either Detroit, Chicago, or Indianapolis, but the highway association realizes that with a great hard surfaced transcontinental boulevard it will only be a question of weeks until every county within a radius of hundreds of miles will have a feeder to the main highway built and open for use.

That the chief executives are vitally interested in the proposed highway as a benefit to their several commonwealths is attested by the fact that the governors

of seven of the eight states traversed between Indianapolis and Los Angeles, accompanied the tour as the guests of Fisher to the confines of each of the several states. In several instances they were accompanied by their state highway engineers with a view to determining the feasibility and probable cost of constructing such a roadbed as the proposed scheme includes.

Survey of Present Route

A survey of the route traversed by the Indiana tour with a view to the availability of the roads for improvement as a concrete transcontinental boulevard shows that with the exception of the state of Utah and one or two passes in Colorado the route is entirely feasible. The exceptions, however, are such that it would seem necessary to change the routing to avoid them if the cost of construction or maintenance were to be kept anywhere near the bounds set.

To take up the portions of the route in detail, there will be found little difficulty in applying the plan east of Denver or Colorado Springs. The crossing of the continental divide, however, offers several routes and the advisability of Berthoud pass, the one which was taken by the Hoosier tour in crossing the Rockies, is open to question. This involves a steady climb of over 4 miles in which the car climbs 3,000 feet, measured vertically.

The last 1,000 feet change in altitude in covered in 1 mile as registered on the speedometer.

Some of the pitches are as steep as 20 per cent and this combined with the rarified air at this altitude of 11,000 feet taxed the motors to their utmost, even, in some cases with the assistance of all their passengers. The roadbed itself is good, but in most places only a few inches wider than the car, with a cliff rising clear on one side and a drop of hundreds of feet on the other. In addition to this there are sharp turns around a shoulder of rock where cars of long wheelbase have to edge with utmost caution.

Turnouts, where other vehicles may pass are very infrequent and if one were met in the entire 4 miles it would necessitate a hazardous backing down till a turnout were reached. In short, in its present condition Berthoud pass is no route for the amateur driver unaccustomed to mountain travel, and to make it either safe or comfortable for the eastern tourist westward-bound with his family would require thousands of dollars.

Berthoud pass, however, is not hopeless. Colorado has the population and the energy to widen out the road and reduce the pitches and it is awaking to the fact that the flood of tourists that follow road improvement more than repays any expenditures required.

Experiences of the Hoosier motorists through Utah lead them to believe that that state is hopeless, from the standpoint of a transcontinental link. It certainly



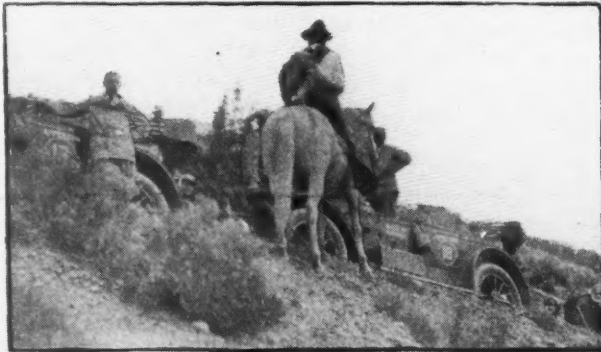
Carl Fisher in the Marmon gets a preliminary taste of road making in Utah Desert



Mountain stream offers welcome opportunity to fill water bags and radiators during 5,000-foot climb to top of Berthoud Pass. Altitude and steep grades make radiators steam so that additions of water to the cooling system frequently were necessary



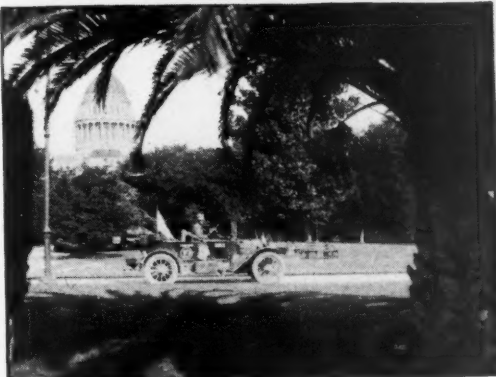
Climbing White Pass in the Sierra Nevada mountains



Apperson drivers bargain for coyote in Nevada Bad Lands. The grade shown here was a constant climb for 10 miles



View of mountains across Lake Tahoe, an indigo-blue lake in the top of Sierra Nevada mountains



Empire poses under palms in capitol grounds at Sacramento, Cal.



On the state highway near Stockton, Cal., a boulevard 70 miles long, the finish of the Panama-Pacific road race

is hopeless if the route they followed is a criterion of transtate roads in that commonwealth. Seven hundred miles of desert waste, a waste such as only those who have breathed its burning alkali and felt the scorching sun can imagine. Vast stretches hundreds of square miles in area, are covered only by sand, bare, black rocks and scrubby sage and mesquite. The only population is huddled close around the infrequent water holes, and except for the ten-mile apart water tanks along the railroad 50 or 100 miles may be covered without sign of human being.

The Great Desert of Utah

Contrary to the general impression in the east, the desert is not a flat plain, but is a series of sinks between rows of steep cliffs or hills that approach the dignity of mountain ranges. The hills, cliffs and sinks alternate in brain-wearying succession for hundreds of miles and around and over them winds the trail with only the white skeletons of thirst-perished animals and the black and yellow iron posts which mark the Midland trail at the points where the infrequent branch paths meander off aimlessly to some equally uninviting haven.

Every hundred yards or so the trail is cut by coulee or arroyo from 5 to 50 feet wide and from 2 to 20 feet deep, nearly always dry, but sometimes damp with alkali seepage or bright with the white alkali frost. Into those the trail ducks and through the larger ones pursues a devious course along the bottom only to scramble out again at some point farther along, repeating the performance in the next 100 yards. In the dry weather ordinarily encountered there is nothing hazardous about the road, except the danger of getting stalled without food or water; but if a cloudburst is encountered, the arroyos and gulches fill with a rushing torrent of water in an incredibly short time and there is nothing to do but camp until the water subsides. When the alkali sinks become soaked with water, progress is almost impossible for the trail then turns into a sea of soft soap.

Such conditions as this were encountered all along the route through Utah with the exception of about 70 miles near the state capital. That conditions ever will be much better without outside aid, either from the state, the federal government or outside sources such as the Lincoln Highway Association, is almost beyond hope. To put that road in shape for a permanent surface and to keep it so in the face of washouts would, it seems, cost the entire \$10,000,000 it is proposed to expend on the entire transcontinental road.

It is not the fault of the spirit of the people of Utah that the roads are in the condition they are. It is because the country will not support people enough to make an impression on the virgin desert.

When one travels 100 miles without sign

of human habitation it is too much to expect that man in such scattered efforts can cope with the elemental forces that rule the waste. In the fertile valleys where people do congregate, they have evidenced in a most striking manner their spirit and enthusiasm for the good roads cause and their appreciation of what a motorable road will do for them.

For instance, the people of Price, Utah, turned out en masse, and made a passable road through a canyon where the wheel of motor car never before had pressed. Minister and saloonkeeper, merchant and rancher, judge and convict took off their coats and for days worked shoulder to shoulder to make a highway through an impassable gulch. This was where the first chain of the Wasatch range was crossed through the Price canyon over a road completed at midnight the night before. Though not a fine example of road-building, the trail through Price canyon was the finest display of the good roads spirit of any encountered.

Previous to the construction of this road 6 hours before the only communication between the towns on one side of the mountains and those on the other had been by the railroad. To go by road had required 33 days over a detour through a pass miles away.

When Westgard passed through last year, there was not even a trail over which a burro might have traveled safely. Westgard had to run over the railroad tracks through part of the canyon and took 2 days to do it. During the 2 weeks since work on Price canyon had been possible a fair mountain road was built so that the 10 miles through the canyon could be negotiated in less than an hour.

A Canyon Road in Utah

The roadway was an eyelash road clinging to the side of the mountain and blasted out of the living rock, the surface is dirt on a bed of great rocks. The only drawbacks are the sharp turns, the fact that usually there was less than 72 inches between a 100-foot precipice on one side and a vertical or overhanging cliff on the other, also the outward slope of the roadbed which marked the banking in the wrong direction. This makes it a difficult trail for cars of long wheelbase; in fact one six-cylinder car slipped a rear wheel over the side, but managed to scramble back onto the road. Like most canyon roads, it was not safe for amateur drivers unaccustomed to mountain work.

But the disheartening part of it all is that this 2 weeks of work of a whole county was washed away in a night, shortly after the main body of the Hoosiers passed and one belated car found the cut simply an impassable mass of debris necessitating a detour of several hundred miles.

With such conditions as this to contend with can it be expected that the

splendid courage which built the road for a tour which was attracting national attention, can keep it eternally rebuilt for individual motorists?

Nevada's roads are much better than those of her sister state. There are extensive stretches of desert but they are more level and the hills are honeycombed with mines, so that there are more people and more incentives to maintain good roads. Much of the territory of this state embraces broad plains of volcanic ash, which in itself forms a natural hard roadbed. California offers the best roads of the tour. The state highway reaching almost from the western border in the Sierras to the coast is a broad level boulevard in ideal condition. The coast road from San Francisco to Los Angeles only needs extensive repairs to make it the same.

Optional Routes

It is quite possible that the worst of the desert in Utah can be avoided by following the Overland trail through southern Wyoming but in this tourists will miss one of the most beautiful parts of the trip, the drive through the Grand river valley and the Canyon of the Grand, they will miss the Palisades and the refreshing orchard country around Grand Junction.

That there will be a transcontinental road along the plans formulated by the Lincoln Memorial Highway Association and that before many years have elapsed, there is little doubt. Those who are familiar with the indomitable energy of Carl Fisher and his associates in the project have little fear for the ultimate completion of a hard-surfaced transcontinental road. However, if, as is contemplated in the present plans they succeed in putting a road through from ocean to ocean, one which will permit of safe and comfortable travel for the eastern tourist and his family, and that before the opening to the Panama-Pacific exposition at San Francisco in 1915, there will have been accomplished an engineering feat comparable in magnitude to the completion of the Panama canal. In the matter of comparative benefit to the whole people of the United States the construction of the road will far surpass all that will be derived from the digging of the big ditch. Not only will it open up to the people of the east a touring ground of more varied scenic interest and wild beauty than the famous playgrounds of Europe, but it will open up to settlement vast regions now neglected because they are inaccessible for development at present.

The flood of American capital now pouring into the coffers of Europe attracted by the excellent motor roads to the show points of England and the continent will be sent westward to the Rockies, the Sierras and even the arid beauty of the desert will prove a magnet to adventurous souls in search of variety.



Empire in National Pine Forest Reserve. Some of the trees in the forest are 6 feet in circumference. On east slope of the Sierra Nevada mountains

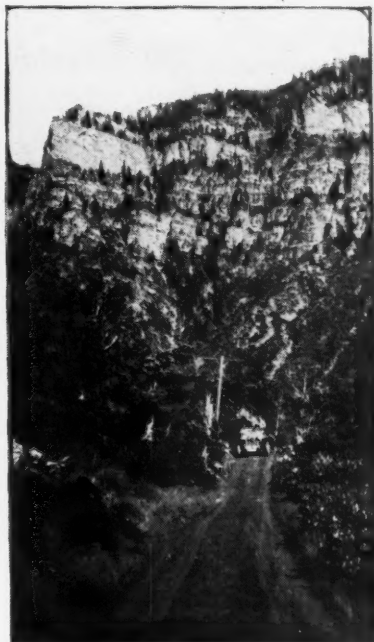


Ready to climb 25 per cent grade over Dugway Summit in Utah Desert



One of many warning signs in Gore Canyon, Colorado. The narrow roadway, very smooth surface, but with steep pitches and sharp turns require care

Stone marking beginning of Santa Fe trail. Erected by Daughters of American Revolution



A bit of the Palisades near Grand Junction, Colo.



Harroun finds a wet road in Owens Valley, Western California



Building a road in river bed where a washout occurred

Hoosiers Check in at Los Angeles, End of Long Tour

Journey from Indianapolis Takes 34 Days in Which Time 3,852 Miles Are Covered—Eight States Passed Through—Good Roads Movement Helped—Incidents of Finish of Run

LOS ANGELES, Cal., Aug. 4—After thirty-four days spent in traversing eight states, the Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association was completed at 5 o'clock Sunday afternoon, the total mileage for the run from Indianapolis being 3,852.3 miles. Despite the boasted good roads of California, the tourists enjoyed the best and the worst highways of the entire tour in the Golden state. The drive from San Francisco to this city, a distance of 558 miles, furnished less than 200 miles of excellent roads, this being confined to the run of 125 miles from San Francisco to Del Monte, 7 miles just north of Santa Barbara, 10 miles south of that city and 30 miles from Owensmouth to the heart of Los Angeles.

With the less than 8 inches of rainfall in 12 months, the roads lay 6 to 10 inches in dust or heavy sand. The tourists followed the coast road which was recommended in the east because it would not be as hot as the valley road and they were told that the 500 miles down the coast could be made in 2 days. They learned to their sorrow that the work of the state was being concentrated on the valley road and that the old oil roads along the coast had not been repaired in 2 years. The San Juan grade between Salinas and San Luis Obispo was as dangerous as the famous Kit Carson pass through the Sierras, and the roads were very rough, the oil crown having broken up and left jagged chuck holes that tested the springs.

Rincon Cut-off Not Passable

The new Rincon cut-off was not passable owing to the absence of a bridge at Ventura and the tourists were forced to climb the heavy, tortuous and dangerous grades of the east and west Casitas passes and the Santa Susanna grade between Santa Barbara and Los Angeles. These roads were 10 inches in dust. The turns were more acute than the grades through Berthoud pass or Price canyon. However, the cars all came through safely, reaching Owensmouth, 30 miles out, at noon and resting there until 3:30. On reaching Owensmouth the tourists were greeted by Miss S. C. Geary, secretary of the Automobile Club of Southern California, and John S. Mitchell, vice-president of the Ocean-to-Ocean Highway Association, who came out with more than 300 private owners to greet the tourists. H. J. Kelley, Los Angeles dealer for the Premier, headed an escort of Indiana dealers that met the cars at Owensmouth and acted as a guard of honor, preceding the cars into Los Angeles, while the privately owned cars trailed the tour. The trip down the coast

was uneventful except for the atrocious roads. At Salinas, where the tourists were the guests of the California Rodeo Thursday afternoon, the cars were paraded around the 2-mile track where the annual wild west show of the state was in progress. More than 1,000 horses, wild and otherwise, with 500 cowboys and cowgirls and fifty steers participated in the show, and the tourists spent 2 hours watching the broncho busting, bull-dogging of steers, attempts to ride several bulls and then the grand finale of the day, a wild-horse race that proved sensational, several riders being thrown heavily.

Brown Truck Reports

On arriving in Owensmouth the tour was joined by the Brown truck with J. O. Holloway and E. M. Harrison, who have been missing since July 14. They were marooned in the deserts of Utah and Nevada by a broken spring and the heavy rains that made the route of the tour impassable and they have spent the last 3 weeks building bridges and roads. After the tour crossed Price canyon's new road three cloudbursts in the mountains washed the road away and the Brown was forced to follow an old railroad grade through tunnels and over the old ties to Castledale from Green River, Utah. Then they took the Salinas canyon and crossed to Ely, where the tourists' trail was followed to Big Pine, Cal. Realizing they were a week behind, they took a short road known as El Camino Sierra, from Big Pine to Los Angeles, crossing the Mohave desert. The men on the truck have camped every night with two exceptions since leaving Ely, Nev. Reports that they had shipped the truck proved erroneous as they have proof that they have passed through all the towns en route with the exceptions noted.

Eighteen cars finished the tour with sixty-one persons. The cars did not draw for positions the last day but came into Los Angeles in the order that they started from the Hoosier capital. The Premier pilot car preceded the tour and was followed by Chairman W. McK. White's Maroon, which acted as pacemaker on the final day of the run. The other cars came in their order of entry, as follows: American Nos. 1 and 2, Henderson Nos. 3 and 4, Marion No. 8, Haynes Nos. 12 and 13, Pathfinder No. 14, G & J truck No. 15, McFarlan No. 16, Apperson Nos. 17 and 18, Empire No. 19, Pilot Sixty No. 20, Brown truck No. 21 and Marmon No. 22. The only car that started which was not in at the finish was A. L. Westgard's Premier No. 11, which was shipped to Portland, Ore., from San Francisco.

At the request of the tour management no entertainment was given here except the reception, and Tuesday the tourists will be taken to Catalina island by the Indiana dealers for a farewell reception and fish dinner. The Hoosier special train will leave Los Angeles at 10 o'clock Wednesday morning. Thursday will be spent at Grand Canyon and the tourists will arrive in Indiana Sunday afternoon at 3 o'clock, where a big reception is planned by the home folks.

DETROIT CONTROLLING HEADLIGHTS

Detroit, Mich., Aug. 2—An ordinance amendment has been passed by the Detroit council for the governing of headlights on motor vehicles. Besides the usual requirements as to the number of lights, there is a clause providing that when a vehicle is being operated or left standing on Woodward avenue or several other of the principal streets enumerated, all exposed lights giving an objectionable glare shall either be turned out or the glare eliminated by some satisfactory means. On the streets not specified it is further provided that such lights as give this objectionable glare shall be adjusted so that the central or focus rays shall be so projected as to strike the ground at a point not to exceed 125 feet from the front of the vehicle.

These provisions are the outcome of several street car accidents in which the motormen have claimed that they had been blinded by the glare of a motor car's headlights. The motorists conceded that many of the lights were objectionable and agreed to city driving with only side lamps, providing that all horse-drawn vehicles would carry tail lights. This was so strongly opposed by the coal dealers and others that the whole matter was thought to have been dropped. The passing of the ordinance is a surprise to the local motor organizations which had been trying to co-operate with the police department in the matter.

DISBROW WINS BEACH MEET

Galveston, Tex., Aug. 1—No records were smashed at the beach races, which ended Wednesday, but the Galveston speed tourney this year was one of the most interesting and the most successful ever held on any sand course in the world.

The track this year was in the best of condition and the crowds which attended indicated that with the proper men and cars on the course motor racing will become one of the pastimes on the Galveston beach.

Financially and in every other respect, the races this year were a success, so much

so that already plans are on foot for bigger prizes and stronger events next year. The fact that such drivers as B. Endicott, Armour Ferguson, J. LeCain, Flying Red Wood and Ralph Mulford, as well as Disbrow, Horan and others have spoken of new cars in connection with the racing on the beach next year, is lending no little interest to the proposition of forming a permanent racing association and making permanent improvements.

The following are the results of the events of the last day:

Twenty-five Mile Race, class E, for cars of 450 cubic inches piston displacement or under—Ferguson, Peugeot, won; time, 22:26.10. B. Endicott, Case Tornado, second; time, 23:16.95. LeCain, Stutz, third; time, 24:44.45. Horan, Mercer, fourth; time, 23:23.90. Ten-mile Handicap, class E—B. Endicott, Case won; time, 12:18.40. Rickenbacher, Mason Special, second; time, 12:24.60. Disbrow, Simplex, third; time, 12:34.12. In this race Disbrow ran the 10 miles in 7:54.40 from scratch, setting another record for 10-mile races on the beach course.

300-mile Sweepstake Race, free-for-all; class D. Run in three heats of 100 miles each day—Disbrow, Simplex Zip, won; total time, 257 minutes, 23.90 seconds, prize, \$2,500 and \$100 additional for finishing first in class 5C. J. LeCain, Stutz, second; time, 263 minutes, 25.45 seconds. Prize, \$1,200. B. Endicott, Case Tornado, third; time, 286 minutes, 21.56 seconds. Prize, \$500 and \$100 additional for finishing first in class 4C. Mosley, Studebaker, fourth; time, 322 minutes, 52.85 seconds. Prize, \$300 and \$100 additional for finishing first in class 1C.

WOLVERINES IN 200 CLUB

Detroit, Mich., Aug. 4—The Wolverine Automobile Club is rejoicing over the fact that it placed eleven winners out of sixteen entries in its first trial for the Two Hundred Club, and thereby outdid the Chicago Automobile Club, which placed nine out of thirteen starters on July 20. The rules require that the 200 miles be covered in 10 hours without a motor stop. The Wolverines who qualified are: A. F. Gregor, Hupmobile; Fred Riddell, Olds; C. A. Boid, Oakland; F. T. F. Stephenson, Ford; C. A. Woodruff, Chalmers; A. P. Chambe, Chalmers; C. C. Cross, Chalmers; Ben Marks, Winton; R. J. Goldie, Chalmers; R. N. Soule, Chalmers; R. C. Kemp, Krit; C. A. Pfeffer, Chalmers; C. F. Curry, Winton; L. N. Taylor, Krit; A. F. Mais, Studebaker, and H. J. Flint, Hupmobile, failed to qualify.

TOUR FOR PREMIER OWNERS

Chicago, Aug. 4—Twelve cars, all Premiers, started this morning on a 2-week tour arranged by W. E. Stalnaker, manager of the Quality Car Co., local Premier agent. Every car was driven by its owner and the itinerary calls for visits to Indianapolis, Columbus, Buffalo, thence into Canada and back home by a route through the Dominion.

SANTA MONICA RACE ENTRIES

Los Angeles, Cal., Aug. 2—Special telegram—When the entries for the annual Santa Monica road race to be run Saturday, closed today thirteen cars had been listed but the ill-ofened No. 13 will not appear. No. 14 taking its place for luck. The distance will be 445 miles

and the race is for cars under 650 cubic inches piston displacement. The entry list is as follows:

No.	Car	Driver
1—	Mercer	Gaston Morris
2—	Apperson	W. W. Bramlette
3—	Mercer	Barney Oldfield
4—	Flat	T. Tetzlaff
5—	Mercer	Louis Nikrent
6—	Speedwell	McConnors
7—	Flat	Dave Lewis
8—	Stutz	Earl Cooper
9—	Buick	John Opsahl
10—	Cadillac	C. H. Soules
11—	Apperson	Frank Coode
12—	Cadillac	C. J. Bramletter
14—	National	Frank Siefert

MICHIGAN CLOSES TEMPORARILY

Detroit, Mich., Aug. 4—The plant of the Michigan Buggy Co., at Kalamazoo, Mich., manufacturer of the Mighty Michigan car, has been closed temporarily pending a reorganization of the company. At a meeting of those interested it was decided to send a force of auditors to Kalamazoo to go over the books of the company, and to secure the services of an expert to determine how to place the concern on a paying basis again. An inventory of the assets has been ordered.

Bablot in Delage Wins at Le Mans

GRAND PRIX FINISHERS		
Position	Car and driver	Time
1	Delage, Bablot.....	4:21:50
2	Delage, Guyot.....	4:26:30
3	Mercedes, Pilette.....	4:27:53
4	Mercedes, Salzer.....	4:34:53
5	Delage, Duray.....	4:35:03
6	Lautenschlager Mercedes.....	4:36:51
7	Schneider, Phoms.....	
8	Mercedes, Elashamp.....	

PARIS, Aug. 5—Special cablegram—Bablot, dean of the Delage racing team, won the 336-mile grand prix de France, run over the Le Mans course and promoted by the Sarthe club, this afternoon in a spectacular speed battle with three German Mercedes entered by Theodore Pilette, the Belgian sportsman.

Bablot covered the 336 miles in 4 hours 21 minutes 50 seconds and averaged 77 miles an hour in his victorious flight. He failed to get revenge for his defeat by the Peugeots in the grand prix of the Automobile Club of France, Boillot and Goux, first and second in the Amiens classic, refusing to start today. The reason for the withdrawal of the Peugeot team is not known at this time. The failure of Boillot and Goux to compete took some of the edge off the struggle, which was expected to be neck and neck between the Peugeot and Delage from start to finish, since these machines are considered the most closely matched set of cars in Europe.

The Delage scored a double triumph for Guyot, driving another Delage, followed Bablot over the line for second money. Pilette and Salzer, the Mercedes pilots, finished third and fourth, respectively, and Duray, the third member of the Delage team, was fifth. Lautenschlager, who won the grand prix of 1908, was forced to be content with sixth place this afternoon. Two other starters finished, Phoms' Schneider and Elashamp's Mercedes.

Guyot went to the front at the start

The company was organized for half a million dollars and for 5 years has been producing motor cars and other vehicles. The output of the motor car department amounted to about twenty to twenty-five cars per day, and there are many orders on hand for the 1914 models.

According to Judge A. J. Mills, attorney for the company, the company is entirely solvent. He declares the factory will not be shut down permanently but will continue operations right along, although perhaps not with a full force.

MORE ELGIN ENTRIES RECEIVED

Chicago, Aug. 6—Ralph de Palma and Spencer Wishart will strive for honors on both days of the Elgin road races, August 29-30. Four Mercer entries were received today, naming them as drivers. Two cars will be in each day. A Marmon, entered by Charles Erbstein, a local lawyer, who has named Joe Dawson as driver, has been named for the Elgin National trophy race on the second day.

and led at the end of the first lap. He was tied in actual time by Christians in an Excelsior, but the latter's success was short lived as he broke a timing gear and was forced to abandon the struggle early in the contest.

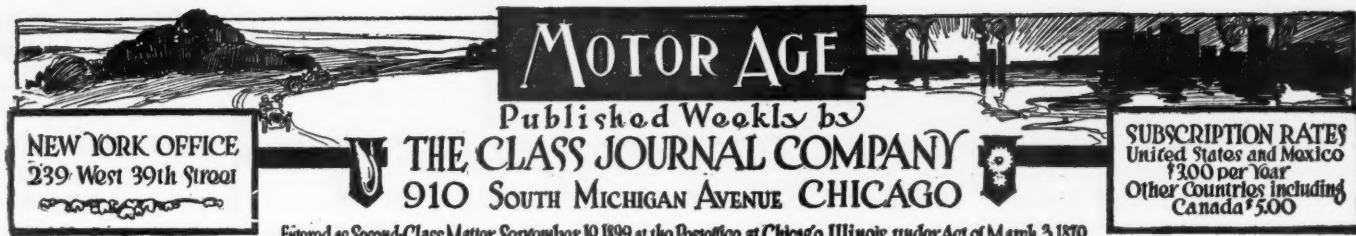
For the first three circuits of the course the Delage trio—Bablot, Guyot and Duray—held the first three places, but this monopoly was broken on the fifth lap where tire and spark plug trouble forced Duray to stop at the pits and gave Pilette an opportunity to bring his Mercedes up into second position. For four laps the Belgian challenged the pace-making Bablot but on the tenth Pilette saw Guyot and the Delage flash by him and take second place.

At the beginning of the last lap Bablot, who had made a stop at the pits, was unable to start his motor. He used three muscular mechanics before he got the engine roaring once more and almost lost the race because of this exasperating delay. It required an average speed of 85 miles an hour on the last circuit—which, by the way, is a new world's record—to land him in first place.

In the early circuits the race was enlivened considerably when two cars caught fire. One was Hornsted's Excelsior and the other was the Gordon-Bennett Brasier racing car, formerly piloted by Thery, which was handled by Soldatenow, an amateur driver, today. Both were eliminated.

One of the features of the race from a mechanical viewpoint was the elimination of three Schneiders, for a similar cause—broken pistons.

Mores, driving a Benz, finally docked the Italian entry after suffering more than his share of tire trouble.



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The Lampless Dash

AT last body designers are cognizant of the fact that the hood, the dash and the passenger-carrying compartments are all a part of what may be termed "the car body." Up to the present many apparently have been ignorant of this. First they had a hood or bonnet, which was according to the engine size; after this came a dash, something of a sensation row, a show window for speedometers, clocks, oilers, ignition apparatus and other appurtenances; and lastly came space in which the passengers might ride. These three parts were separate, each a law unto itself, and each designed with but little regard for the other. When linked together the medley was the body. The passenger-carrying compartments might be designed on the straight-line principle; on the concave or convex form; or on any combination of these, but the dash was straight, cowed, high, low, arched or flat according to what it had to contain and how it had to contain them. The hood was barrel-shaped, cubical, triangular, D-formed, or of any other type according to the motor, its accessories and how they were placed.

TODAY a new regime is giving symptoms of its approach. It is the regime of body design, a regime in which the design begins with the radiator and ends, we hope, with an inclosed compartment in the rear for the spare tires or wheels. The hood is made to gradually converge into what has been known as the dash, and the body is given sufficient consideration so that it is but a continuation of the scheme. In a word, there is an effort at design; an effort to eliminate the dash or cowl and gradually converge hood and body, that portion where the transition takes place still being cowl, dash or whatever name suits.

A STEP in making this hood-body transition easier is leaving off the dash lights and combining them with the headlights. This actually is being done by a few enterprising makers and with commendable results. It is an easy task: One maker uses two electric bulbs in each headlight, one low candlepower bulb when the light is used solely for signal purposes, and the other a high-candlepower bulb for use in the strict headlight sense. Another maker uses but one bulb, a high-low type, in which a resistance is used to give a dim non-dazzling light for street signal uses. The result of such combination is highly successful and it permits of making the cowl, as it is becoming known, a suitable transition between the hood and the passenger-carrying compartment. The body appearance is immeasurably improved by such an arrangement.

BUT there is further merit to the combined headlight and dash lamp within one lamp carried at the radiator, in that the low candlepower bulb when so positioned actually is of some value to illumine the road, whereas when carried on the cowl its value is only as a signal, its road illuminating qualities being practically nil. In the radiator position the electric rays give a good illumination of the road surface for 15 or 20 feet ahead of the car, which is valuable in emergencies, there being not a few examples on record where headlights have failed in road travel and the tourist has had to hang his trouble lamp from the radiator filler cap in order to get an adequate light to travel at 12 to 15 miles per hour.

WHEN spare tires or wheels are properly hidden from the public gaze; when lamps are made subservient to the general body scheme; when the body design, as a worked-out whole to cover the motor, carry the control parts and accommodate the passengers as well as a moiety of baggage; and when tops are for service and not looks; then motor cars will be sensible appearing quantities, well-dressed gentlemen with frock coats, silk hats, gloves and shoes in harmony. The car will be a vehicle of travel.

APULLMAN railroad coach is a design from platform at one end to the platform at the other end. True, it may have an electric motor-generator at one end; it may be part buffet car and part reading car, but externally it has a single scheme of design. If the dining car occupies one end, that part does not have to be of different exterior form from the opposite end which is occupied by the reading room or a passenger compartment. The car from end to end is a unit of design. The motor car body can similarly be made a unit design from end to end and not a disagreeable medley.

Self-Starting Fuel Economy

THE car with a sane fuel economy and also a sane acceleration is getting a little more attention than it did a year ago. In the past the spectacular was too much in the limelight. The attractive car was the one that the driver could press all-the-way-down on the accelerator pedal, the back of the seat would hit him a reminding blow of the car's ability to accelerate, and tire adjustments later told of the cost of such grandstand attractions. The 7 or 8 miles per gallon of gasoline constituted an additional chapter to such absurd driving.

THE car manufacturer was a silent partner of the demonstrator or driver in such irrational acceleration. He adjusted his car for such work. He insisted that the carbureter maker give an apparatus capable of such. He demanded that his engineer design a motor capable of going from 0 to 70 miles per hour in the fewest possible seconds. He talked acceleration in his house organ. Acceleration was on the lips of every salesman. Acceleration was a first cousin to high-gear-hill-climbing.

SANE acceleration is partly due to carbureter adjustments, and carbureter adjustments are being altered for 1914 as compared with 1913. Some makers are displaying the good judgment of adjusting their carbureters for road running and economy, rather than easy starting and irrational acceleration. What does this mean? It means that the carbureter is so set that hand cranking would be almost impossible, but cranking with a self-starter at 125 to 150 revolutions per minute is entirely successful. Such a carbureter adjustment gives greater fuel economy in road running, an object most desirable in these days when fuel economy and higher engine efficiency are on the lips of all sane engine and car makers. This aspect of self-starter economy is one worthy of greater attention and car owners who are not getting that mileage per gallon which their neighbors are attaining can check up their own ways by seeing if the carbureter adjustment is set to give the best road running, rational acceleration and perhaps relatively easy starting.

Wisconsin's New Motor Code Declared to Be Model Law

State Measure Has Precedence Over All Others

MILWAUKEE, WIS., Aug. 2—Wisconsin's new motor code, act of the legislature of 1913, and considered the model state law regulating motor vehicles, went into effect on August 1, having been signed by Governor F. E. McGovern on July 30 and published on the following day. Motorists of the state are jubilant over the passage of the bill, for it is regarded as eminently fair to both motorist and pedestrian and could with profit be copied by other states of the union.

A feature of the new code is that it prevents cities, counties, town board, park or highway boards from passing or enforcing any ordinance or resolution fixing requirements upon drivers and operators of motor vehicles. The state law is supreme and for 2 years at least, Wisconsin motorists and outside motorists who tour in Wisconsin will not be harassed by sundry local ordinances that every cross-roads settlement may wish to pass, as in many other states. The outside motorist who comes into Wisconsin will need only to comply strictly with the compact state law and disregard local restrictions entirely. Touring in Wisconsin will be made doubly pleasant by the feeling that it no longer is necessary to stop at the outskirts of every little hamlet and inquire about the local laws.

The preventive section makes the new Wisconsin law the strongest in the United States. The old law had a similar feature, but this was not by any means as effective, as it stated that no local ordinances "inconsistent herewith" could be passed or enforced. The new section reads:

The provision of sections 1636-47 to 1636-57, inclusive, shall be uniform in operation throughout the state, and no city, village, county, town, park board or other local authorities shall have power to enact, pass, enforce or maintain any ordinance, resolution, rule or regulation, requiring local registration, or other requirements * * * or in any manner excluding or prohibiting any motor car, motorcycle or other similar motor vehicle, whose owner has complied with the provisions of said sections, from the free and unobstructed use of all public highways, driveways and parkways within the state. * * *

The asterisks in the above represent the words dropped from the old statute in making up the new law, which were "inconsistent herewith."

Among the requirements in the new law which have heretofore appeared only in local ordinances in various cities, are the following:

Prohibiting the use of the muffler cut-out within the limits of any incorporated city or village in Wisconsin.

Reducing speed to 8 miles an hour while passing through parks and cemeteries, or by school grounds where persons may be in the highway. The old speed limit of 15 miles per hour in cities and villages and 25 miles per hour in the country are unchanged, excepting as provided above.

Requiring all motor vehicles to be equipped with an "adequate signal device" and making it unlawful to use a signal that shall not produce an abrupt sound sufficiently loud to serve as an adequate warning of danger; also making it unlawful to make unnecessary noise with such signal or using it except as a warn-

ing of danger. This is the "sensible signal" law passed by many cities and in some states.

Requiring all motor vehicles to stop when any street car is actually taking on or discharging passengers at the crossings or intersections of any public streets or highways, until such passengers shall have been taken on or discharged.

Reducing the time when lamps shall be lighted from 1 hour after sunset and 1 hour before sunrise to 30 minutes after sunset and 30 minutes before sunrise.

Fixes the punishment of any person convicted of taking, using or operating any motor vehicle without the consent of the owner thereof, at not more than 5 years in state prison, nor more than 1 year in the county jail, or by a fine of not more than \$1,000, or both fine and imprisonment.

Provides automatic traffic regulation by giving the driver or operator of any vehicle the right of way over any vehicle approaching him from the left at any cross street or intersection, excepting in cases in cities where a police officer shall be in actual charge of the regulation of traffic at the intersection of any street or highway.

Increasing the registration fees for manufacturers and dealers from \$5 to \$10 per annum, but granting them eight sets of number plates instead of four, as formerly.

Making it unnecessary for an owner who has sold his car and purchased another to take out a new license and plates at the usual cost of \$5 for registration, but giving him the right to transfer his old registration and license plates to his new car on payment of a fee of 50 cents to the secretary of state for the issuance of a transfer of the former registration. All registrations expire on December 31 of each year.

Prohibiting the use of so-called siren horns on any motor vehicle excepting such as are used by fire or police departments, hospitals or fire insurance patrols. Thus the siren horn is made the distinctive signal for these classes of motor vehicles.

Increasing the maximum penalties for the second violation of the speed laws in any one year, or while intoxicated, to \$500, or 60 days in jail; and in cases where driver or operator of motor vehicle runs away upon causing an accident, without giving aid or disclosing his identity, the maximum penalty is raised to \$1,000 or not less than 3 months nor more than 2 years in jail, or both.

Reducing the speed of motor vehicles to 15

miles per hour when meeting upon any highway, the traveled track of which is less than 20 feet wide; and requiring all vehicles to meet to the right and pass to the left of all vehicles overtaken, each to give to the other vehicle one-half of the road.

The requirements contained in the old laws, such as prohibiting persons under 16 years of age, unless accompanied by parent or guardian, and intoxicated persons from driving or operating motor vehicles; and making it unlawful to drive or operate a motor vehicle recklessly or at a rate of speed greater than is reasonable and proper, having regard to the width, traffic and use of the highways and the general and usual rules of the road, or so as to endanger the property, life and limb of any person, are retained in the new law.

Dealers or manufacturers who knowingly permit the use of their number plates on cars owned or controlled by others, are liable to a fine of from \$10 to \$25.

The law was drafted by James T. Drought, president of the Wisconsin State Automobile Association and a well known attorney of Milwaukee, who was mainly responsible for the organization of the Milwaukee Automobile Club, the first organization of motorists in the Badger state, and who still is counsel of this club. It was introduced by Senator Alex E. Martin, of Milwaukee, and was one of the final bills to be passed and signed at the 1913 session of the legislature.

PAIGE GIVEN R. A. C. TEST

London, July 26—Officials of the Royal Automobile Club yesterday gave out the certificate of performance of a 25-horsepower Paige-Detroit, an American car which underwent a trial on the Brooklands track June 23. The slowest speed attained over 110 yards was 4.31 miles an hour and the highest speed over the flying ½-mile was 51.71 miles an hour. During the time the car was under the observation of the R. A. C. officials the engine was started with the electric self-starter fifty-one times, the longest interval after which the engine was started was 45 minutes and during five starts, there was momentary difficulty in depressing the pedal which actuates the starting mechanism.

HEINZE OPENING CANADIAN PLANT

Detroit, Mich., Aug. 4—Plans are being perfected for the organization of a \$75,000 concern under the name of the Heinze Electric Co., Ltd., of Canada. The present company at Lowell, Mass., is the manufacturer of electrical apparatus, and makes spark coils for the Ford Motor Co. The new company is being created for the purpose of furnishing coils to the Canadian Ford factory, and will be established in Walkerville, Ont.

LONDON TAXI COMPANIES MERGE

London, July 27—After negotiations lasting 2½ months a contract was signed today in Paris for the amalgamation of the three principal London taxicab companies. The combination will be known as the British Motorecab Co. The capital involved is \$5,600,000.

Coming Motor Events

CONTESTS.

July 1-August 12—French army trials.
August 9—Road races at Santa Monica, Cal.
August 12—Kansas State Automobile Association endurance run to Colorado Springs.
August 18-20—Fourth annual Wisconsin reliability tour.
*August 29-30—Elgin road races, Chicago Automobile Club.
August 30—September 6—Reliability run, Chicago Motor Club.
September 9—Corona beach race, Cal.
September 1—Track race, Columbus, O.
September 8-15—Around Lake Michigan tour; Chicago Motor Club.
September 12—Track meet, Canfield, O.
September 13—Track race, Grand Rapids, Mich.
*September 13—Track meet, Covington, Ky.
September 20-21—Track meet, Detroit, Mich.
September 21—French light-car road race, Boulogne.
September 25—Tourist trophy stock-car road race, Isle of Man, Great Britain.
October 4-11—Chicago Motor Club's Around Lake Michigan reliability.
November 6—Track meet, Phoenix, Ariz.
*November 24—Vanderbilt road race at Savannah, Ga.
†November 27—Savannah grand prix.
†Sanctioned by A. A. A.
†Sanctioned by A. C. A.
Shows
October 17-27—Paris show.
November 7-15—Olympia show.
January 24—Chicago show.
January 31-February 7—Minneapolis show.

Trend Shown by English Truck Show

Steel Wheels, Smaller Motors and Worm Drive

LONDON, July 31—The use of steel wheels is growing abroad, these being almost standard for trucks of over 2 tons capacity. Motors are getting smaller for the rated horsepower, due to better lubrication, etc., not the least of the reasons being better workmanship. Worm-drive makers are increasing, most truck manufacturers including in their line at least one model, which has this form of final drive. Frames are being made more flexible, rubber tires are being added to the big steam tractors, unit power plants are almost universally used in trucks below 2 tons capacity, while auxiliary power devices and loading and unloading devices are being multiplied.

The trucks of this year are vastly better fitted to various trades than formerly, and machines can be had from 10-ton steam lorries to 300-pound delivery cycle-cars.

Thus, in short, are the tendencies of the hour, as shown at the Olympia commercial vehicle show, just closed in London, the most comprehensive exhibition of commercial vehicles ever shown abroad, and the first held at Olympia since 5 years ago.

The Britisher is just beginning to wake up to the real possibilities of the motor truck, and while, as seems to be a British trait, there seems to be more mechanism to some of the machines than is necessary to do the work, there is more refinement shown than formerly.

Radiators are better hung and protected, this due very largely to the plan of the war office to subsidize motor trucks which are up to certain government specifications. This has led to the fitting of radiator guards, and of towing hooks at the corners of the frames, so that in case the machine gets bogged, or sinks into a rut where it can get no traction, other means can be used to pull it out. In some cases auxiliary hauling drums are fitted which can be used to pull the cars out, and in other cases these are only to assist in the loading and unloading.

Transmissions are better made than formerly, and in many cases smaller. This is due to better material and workmanship, the latter due in many instances to better factory organization. A feature which it is predicted will be adopted very largely is the idea of leather universals as shown on the Daimler truck. This type has been used on Isotta cars for some time with complete satisfaction.

The Knight motor has been adopted by the Siddeley-Deasy truck as standard, and it is possible that others will follow suit. The Daimler company has used this type of motor for some time.

A feature of the show was the number of small vehicles, carrying from 300

pounds to 900 pounds. These were built on cyclecar lines. The Girling and A. C. were the more noticeable, these being used by most of the big London concerns which do house-to-house delivery where there are many stops per mile.

In the bigger machines there was noticeable, also, a better weight distribution, and many dump bodies, called tipping bodies abroad, were exhibited. The Halley machine for colonial work was shown fitted with steel disk wheels.

In the effort to get away from too much mechanism the Hillman truck was shown fitted with a V-type, twin-cylinder motor of very powerful and accessible appearance. Otherwise the machines were no more accessible than formerly, with few exceptions of details.

SETTLING MIDLAND AFFAIRS

Bloomington, Ill., Aug. 2—A complete report of the assets of the defunct Midland Motor Co. will be made to the creditors shortly, by Edward McCullough, trustee for the concern. Following the report, arrangements will be made for the sale of the plant at Moline. A number of companies are looking over the plant and the Colby company is mentioned as a likely prospect. The trustees and creditors appeared before the court in Rock Island on Tuesday for an examination.

CUTTING SALE POSTPONED

Detroit, Mich., Aug. 4—The receiver's sale of the Cutting Motor Car Co., to have been held at Jackson, Mich., on August 5, has been postponed for not less than 2 weeks, by order of the federal court. The Security Trust Co., of Detroit, was appointed receiver upon the petition of an outside creditor, and has been carrying on the business for some time. Last week four other creditors filed a petition in bankruptcy and Judge Sessions ordered the sale postponed until this petition had been acted upon.

Two law suits, distinct from the receivership proceedings, have been commenced by the Wisconsin Motor Co. against the Cutting company and the endorsers of its notes, for motors shipped to them. The Cutting company has withheld payment upon these shipments upon the claim that the motors were defective.

RANDS BUYS WARREN ASSETS

Detroit, Mich., Aug. 4—At the auction sale of the Warren Motor Car Co., carried on by Mr. Baur for the Detroit Trust Co. today, the total assets were bid in by W. C. Rands, for the Rands Mfg. Co., at \$120,000. At the first sale Mr. Rand's bid of \$104,600 was raised by the Peter Smith Heater Co. after the sale was thought to be closed, and the court

ordered that the sale be re-advertised. The Peter Smith interests were the next highest bidder in the second sale. The bidding lay entirely between Mr. Rands and the Smith company and was carried on in \$500 steps up to the \$100,000 mark, after which it was raised by \$1,000 bids. The Smith representative retired after bidding \$119,000.

Directly after the sale Mr. Rands stated that the new property would be used exclusively for accessory manufacturing and would constitute the third link in the Rands company chain. Because the deal is not quite completed the name of the second property that is being acquired was withheld for the present.

Until the Warren sale is confirmed by the court Mr. Rands will not be in a position to make arrangement for the disposal of the motor car parts and assemblies. For the present Warren owners will be furnished with what repair parts are in stock, from the factory, in the same manner as under the receivership.

In the bidding on the separate parcels, the Martin Motor Sales Co., of Detroit, made a bid of \$17,000 at the first sale and \$12,000 at the last sale, for the parts, which, however, was thrown out when the complete assets were sold.

HOOSIER BODY PLANT BURNED

Indianapolis, Ind., Aug. 5—Fire last Wednesday night destroyed the plant of the Showalter Mfg. Co., 314 Hanson avenue, manufacturer of motor car bodies. It is thought an explosion of gasoline caused the fire which burned the plant to the ground. The loss to the company was about \$12,000. A new plant in another location is to be obtained at once. The company suffered considerable loss during the March flood. There was a loss of about \$18,000 from the burning of motor cars belonging to W. J. Holliday, Henry Doleman, Nordyke & Marmon Co. and Premier Motor Mfg. Co.

MILWAUKEE HAS MOTOR PARADE

Milwaukee, Wis., Aug. 5—The longest and most elaborate motor procession ever seen in Milwaukee was that held as the feature of today's celebration of the 100th anniversary of the birth of Commodore Oliver Hazard Perry, naval hero of the war of 1812. There were 319 motor-propelled vehicles, gasoline, electric and steam, in line, and each was lavishly decorated in red, white and blue colors. It required 2 hours 30 minutes for the procession to pass the reviewing stand. The Stegeman Motor Car Co., of Milwaukee, carried off the honors for having the largest number of its trucks in line.

RECEIVER FOR WALPOLE COMPANY

Boston, Mass., Aug. 2—Judge Dodge of the United States district court of Boston appointed Robert Fisher of New York city receiver for the Walpole Tire Co., of Wal-

pole, Mass., pending an adjustment of the company's finances. Although the company is entirely solvent it has become financially embarrassed by the closing of the Atlantic National Bank of Providence, R. I., which was the financial agent for the company. The receivership was granted upon a petition of Renslaer Curtis of Franklinville, N. Y., who holds a claim against the Walpole company as a receiver for the Atlantic bank, which amounts to \$121,570. It is expected the company will resume operations shortly.

The Walpole company is said to worth far in excess of its liabilities. Its total assets are estimated to be valued at \$4,126,635, and the total liability is set at \$1,353,359. The Walpole company was formed by men identified with the Walpole Chemical Co., one of the biggest concerns in the country, making all sorts of rubber goods for many years, and which supplies the government with tape.

BIDWELL WINS IN BUFFALO COURT

Buffalo, N. Y., Aug. 5—Justice Frank C. Laughlin in the supreme court handed down his decision refusing to continue the injunction sought by the Northland Rubber Co. to restrain Alfred C. Bidwell and others from circularizing the stockholders of the company in an alleged attempt to get them to transfer their stock to the International Automobile League of Buffalo. The court on another motion charging contempt of court for failure of the defendants to obey the order of Justice Edward J. Emery, found the International Automobile League and James J. O'Shea, its manager, guilty of criminal contempt. He fined the league \$250 and O'Shea \$50. Justice Laughlin finds that there was not a civil contempt as asked for by the plaintiff, but a criminal contempt by reason of the failure of certain of the defendants to obey the order of Justice Emery, whether that order was right or wrong.

MORE DEBATING ON CAR TARIFF

Washington, D. C., Aug. 6—Special telegram—A spirited debate took place in the senate yesterday when the motor car paragraph of pending tariff bill was reached. The principal vote of the day came on a motion of Senator Brandegee to increase duties on motor cars. This amendment was defeated by a vote of 21 to 46, all democrats voting against it and seven republicans.

Senator Cummings already has offered an amendment wiping out all classifications as to motor cars and applying a general duty of 25 per cent. This will be voted on later. After 2 hours debate the senate adopted the amendment reported by the finance committee, which fixes duties on motor cars as follows: Valued at \$1,500 or over, 45 per cent; valued at less than \$1,500 and more than \$1,000, 30 per cent; valued at less than \$1,000, 15 per cent; chassis and finished parts, not including tires, 30 per cent.

Alcohol the Only Hope in Great Britain

English Discuss Fuel at Big Conference

LONDON, July 23—What perhaps was the largest gathering of people which has so far met from all four corners of the earth to discuss motoring matters took place at Olympia on Monday, when the imperial motor transport conference opened. The delegates numbered considerably more than 200; but they were not all motorists, nor for the most part were they directly concerned with motoring. The majority of them represented the agricultural, prospecting, military and industrial interests of Britain's over-seas dominions, and had come to the mother country to appeal to the best authorities in England on problems connected with motor transport, which is to prove so very large a factor in the development of the more remote parts of the British Empire. The importance of the conference may well be gathered from the fact that all the secretaries of state for the various dominions, crown colonies, dependencies, and so forth; the president of the board of trade; the postmaster-general, and the secretary of state for war were all among the vice-presidents. The president was the Duke of Connaught, and the gathering was opened by the Marquis of Crewe, who is the leader of the government in the house of lords.

The first day was devoted to a discussion of the fuel problem, by far the most interesting subject before the conference, and among the experts who gave their views were Sir Boverton Redwood, Bart., Professor Vivien Lewes, A. Butterfield and Colonel Crompton. The first two men offered a joint paper, and Mr. Butterfield had written another, all concerning the present high price of gasoline, and suggesting ways out of the difficulty. These documents formed the basis of the discussion. The gist of what came to light is as follows:

The development of motor transport is being severely handicapped by the high price of gasoline, which is due to some natural, and some artificial, restrictions of the source of supply. At any rate, the world's oil fields are being continually depleted, and must at some time give out, because the natural forces which went towards their making no longer exist. But the same thing is true of the sources of supply from which it has been suggested that alternative fuels should be derived—namely, shale-oil, crude petroleum and coal. Therefore, motorists must look in some other direction for a complete solution of the problem, because all these fuels must tend to rise in price as the supply becomes less secure; though it was admitted that a great deal could be accomplished in the way of consumption economy by the development of the science of "cracking" the oils, as yet in its infancy, and also by the improvement of carburation.

The only suggested fuel which was not subject to this law of depletion was alcohol, because it was an artificial chemical production, and could be made from cereals or even sawdust. The majority of the colonial delegates favored the development of the alcohol proposition because, though coal, shale-oil and petroleum are to be found in fairly large quantities here and there throughout the British dominions, many tropical and semi-tropical colonies like South Africa have a great supply of cereals and other vegetable products, and it would be greatly to their advantage if they could obtain their own fuels from this source.

The question of the modification of the gasoline engine for the use of alcohol was regarded as a light one, compared with the difficulty of persuading the British government to remove the exceedingly heavy excise duties on the spirit. The position was really a deadlock; the manufacturers would not go to the expense of producing an alcohol engine until the government promised a reduction of the excessive duties, and the government used the excuse that it could not remove the duties until an efficient engine had been produced.

But the colonials seemed optimistic and said that they thought their governments would bring pressure to bear on the mother country if she tried to stand in the way of their interests; and they promised money ist's only hope was carried unanimously.

A resolution to the effect that alcohol was the fuel of the future and the motor-to help pay the cost of exhaustive research.

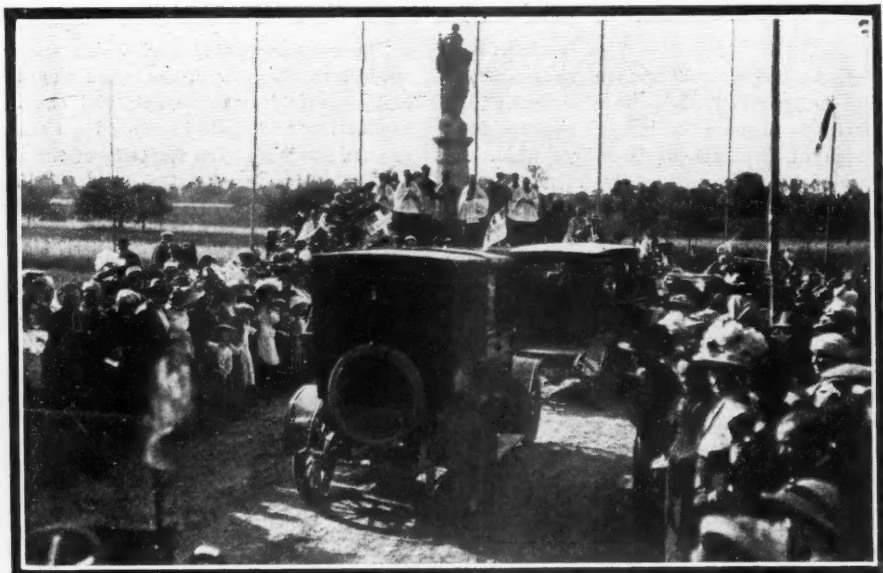
GARAGE CASE APPEALED

New York, Aug. 4—An appeal has been filed by the Joseelyn Garage Co., New York city, from the recent decision of the appellate division of the supreme court of New York. The decision decreed that the 50-foot garage ordinance forbidding the issuance of an operating permit within 50 feet of a school, moving-picture theater or the like. The filing of the appeal will enable garages which otherwise would be forced to stop business, to continue until a final decision has been given by the court of appeals at Albany.

CHANGES IN KEETON COMPANY

Detroit, Mich., Aug. 6—The Keeton company has been refinanced and will be greatly enlarged. H. H. Newsome, formerly manager of the McCord company and recently of the Hayes Mfg. Co., has been made general manager. Forest M. Keeton will act as special factory representative, establishing branches throughout the United States. W. G. Houek retires to push the American Voiturette Co., which is backed by Charles B. Shaffer, president of the Keeton company.

Recent and Interesting Motoring Events Pictorially Told



BENEDICTION SERVICE FOR MOTORISTS

ST. CHRISTOPHER is the patron saint of motorists and all who travel. Thus the priest of the little village of St. Christophe de Jagoulet, about 100 miles to the west of Paris, recently decided to hold a benediction service for the special benefit of motorists. The sight was both unique and curious. The full body of clergy were grouped around the monument of St. Christopher, chanting psalms and breaking holy water over elegant limousines, speedy roadsters, comfortable touring cars and ponderous motor trucks as they paraded past at a sober pace.



FRENCH BOAT BODY

ONE of the latest ideas in the sporting type of motor car is the pure boat body. One of these is shown in the accompanying illustration, built on a 20 horse power Panhard-Levassor chassis. The body is built up on ribs, carvel type, in exactly the same way as a boat, has its bilge rounded off at the point where it joins the chassis, and is made with a tumble-home stern. The most difficult feature for the boat builder was the design of the forward sections so that they would harmonize correctly with the bonnet without giving a cut-off appearance. Naturally the bonnet has been specially designed for the body, as is now done on all high-class European bodies. To preserve the harmony of the lines, no doors have been made, the shape thus being continuous from radiator cap to stern. The gasoline tank is placed amidships just behind the front seats. In this position it forms a partial deck and still further adds to the boat-like appearance of the body. Electric lights are fitted, the side lights being let in the scuttle dash and the head lights being of the ordinary type. Except on the seats, there is no interior upholstery, the sides of the body, with the ribs and the rivetting, being left exposed, as in the case of a boat. An illustration of the new body is herewith presented.



AGAIN THE ABERNATHYS

FAME has again turned the spotlight on the Abernathy kids, who, like particles of Chicago dust and ambitious bugs, are constantly getting into the public eye. These boys, one 13 years old and the other aged 9, first obtained free newspaper publicity 3 years ago when they rode on horseback from Frederick, Okla., to New York to shake hands with Colonel Theodore Roosevelt. The following year they switched their allegiance from bronchos to motor cars and drove a Brush runabout from Oklahoma to the effete east. Fickle youngsters, they have abandoned the motor car for a tandem motorcycle, on which they are riding from their far western home to the nation's metropolis. The illustration shows Temple Abernathy, 9 years old, starting a big 50-horsepower touring car which is equipped with an Aplco electric engine starter. It is a far cry from shaking the hand of America's most strenuous citizen to pushing the button on an electric starter, but Temple Abernathy smiled with as much satisfaction when he worked the mechanism as when he greeted the Bull Moose leader.

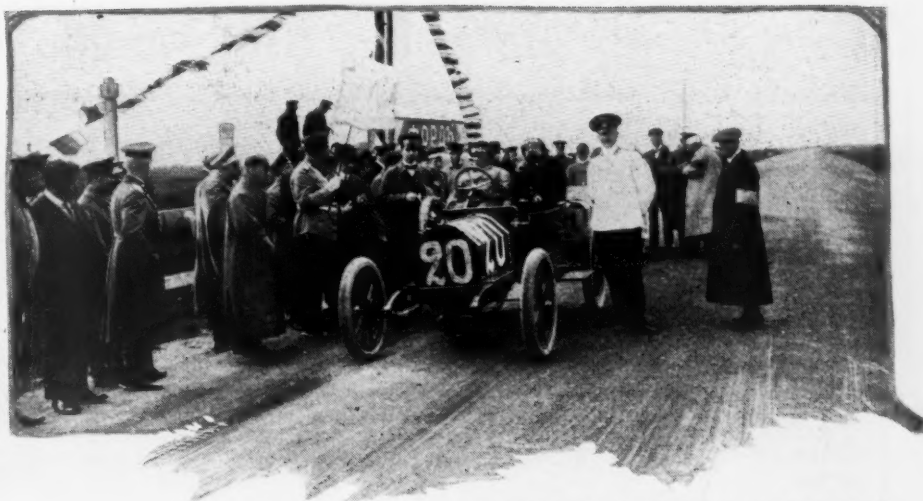


VAUDEVILLIANS TRAVEL IN MOTOR CARS

LONG jumps get the professional goat and the artistic temperament of the stars of the two-a-day circuit who, unlike the legits and the Uncle Tommers, must pay their own travelling expenses in migrations around the vaudeville wheel. To escape long jumps, or rather, the attendant cost, is the aim of all vaudevillians, an ambition that has been realized by the "Four Armstrongs," "the world's greatest quartet of cyclists," in a rather unique way. The troupe—two men and their wives—is cheating the railroads, attending to business and enjoying a vacation at one and the same time in a jump from New York to San Francisco, which is considerable jump even for a strong-limbed frog. They are touring across the continent in the National which won the stock car championship at Elgin in 1911 and which has been sold several times to various persons, and scoring a knockout with their act in every city where they stop over for a week's engagement. The Clipper please copy.

HUPMOBILE WINS RUSSIAN GRAND PRIX

WHILE two sturdy Hupmobiles were pounding over the plains and mountains of Minnesota, North Dakota and Montana and escaping penalties in the eleventh annual Glidden tour, another car of the same make was making a name for itself in the empire of the czar, a 20-horsepower roadster winning the grand prix of Russia and completing the reliability tour with the only perfect score recorded. The illustration shows the triumphant Yankee contender at the start of the run. The Russian grand prix, which was run for the first time last month, is an endurance contest similar to the American reliability tour, but it is said to be a great deal harder and taxes the contending cars more severely. No assistance is allowed a contestant. The car must get over the run entirely on its own merits, and that is no easy task in Russia, where the roads are not of the best.



ARMORED CAR USED BY SPANIARDS

THE phalanx of Alexander, the legions of Julius Caesar and the Old Guard of Napoleon, invulnerable fighting machines in days gone by, had best look to their laurels. They have a rival that bullets cannot pierce or sabers cut, an armored motor weighing 9.35 tons, which was constructed by the Schneider company of France for the Spanish government and extensively used during the recent African campaign. The body, like Gaul, is divided into three parts—the cab, the "blockhouse" for the attacking sharpshooters and an ammunition compartment at the rear. As a maker of dead soldiers, this armored motor is said to be in a class by itself and a little better than any weapon ever forged by Vulcan for Mars, god of all militants except the suffragettes. A four-cylinder engine with a bore and stroke of 5 and 5½ inches, respectively, is employed to drive this vehicle; this develops 40 horsepower when running 1,000 revolutions per minute. The carburetor enables gasoline or benzine to be used without any modification or adjustment. Ignition is effected by a high-tension magneto and cooling on the thermo-siphon system. A pump driven direct from the engine effects the lubrication. Within the flywheel there is located a clutch

CYCLISTS FASTER THAN MOTOR CARS

USUALLY the motorist can afford to show a considerable amount of disdain towards the cyclist as a speed merchant and a long distance traveller. There is one exception, and probably only one, in the whole world. It is the annual bicycle race round France, a distance of 3,350 miles, covered in fifteen alternate days. The distance is greater than that of any motor car tour in Europe, and on the stages through the Alps and the Pyrenees the professional cyclists prove themselves capable of maintaining an average speed as high as that possible with a good car. The duel between bicycle and motor car takes place on the two Alpine stages from Nice to Grenoble and from Grenoble to Geneva, each one about 200 miles in length, when the cyclists keep up an average that only a high-powered car can equal. On these two stages of the race the maximum altitude attained is 9,000 feet over the Galibier pass. The motorists have the advantage in the long winding climbs, but when the 10- and 12-mile winding downhill portions have to be tackled, the hardened bicyclists get away at speeds of 30 to 35 miles an hour. They pull up quick at the corners, get round without any loss of time, and pedal ferociously down the next straight leg. The driver of a car, bound to exercise extreme caution on the turns, is quickly left in the rear, and unless he has a head wind to contend with, the rider of the slender bicycle will cover the 200 miles of mountain road in equal or better time than the chauffeur.

of the Hele-Shaw disk type. The change-speed gear comprises three forwards speeds and one reverse. The transmission from the change-speed gear to the differential gear is by cardan shaft, and the driving power is finally transmitted by spur pinions engaging with internally cut gearings on the rear wheels.

All gearings are completely inclosed and thus protected from mud and dust. The steering column is located on the left side of the chassis, the control being on the driver's right hand. An external brake fitted with metal shoes is operated by a foot lever which at the same time actuates the clutch. Another brake is operated through wire cables by a lever





START OF THE TIMES-HERALD ROAD RACE IN 1895 FROM JACKSON PARK, CHICAGO

America's First Horseless Carriage Road Race

Some Motor Speed Retrospections

EARLY in May of 1912, Teddy Tetzlaff, at the wheel of an Italian Fiat, established a new world's road racing record of 78.61 miles an hour in winning the annual Santa Monica classic. In the intervening year since that memorable May day, I often have compared the record-breaking feat of the powerful Fiat with that of the antique and forgotten Mueller, which, on November 2, 1895, won the first speed contest for motorcycles or horseless carriages—the names by which motor cars were known 18 years ago—ever held in America by averaging 13 miles an hour in a 90-mile drive from Chicago to Waukegan and return.

150,000 See Race Start

In the dual capacity of referee and spectator, I witnessed this race which attracted 150,000 curious inhabitants of the western metropolis to Jackson park, the starting and finishing point, and I would consider myself selfish indeed if I did not share my present retrospections with the motorists of to-day.

Only two cars competed in the contest of November 2, 1895, and the Mueller was the only one to finish, although about ninety entries were made. About a week before the scheduled date of the race, which was promoted by the Chicago Times-Herald that offered a prize of \$5,000 to the winner, the majority of the makers who had nominated cars discovered that their ancient motors would not generate enough power to move the machines out of the shops and forty-four builders attached their names to a petition, asking the judges for a postponement. This petition—which is interesting to me since but one of the signers is building cars to-day—was presented to H. H. Kohlsaat, publisher of the Chicago Times-Herald, who agreed

By W. H. McIntyre
President of the W. H. McIntyre Co.

to the postponement, but hung up a consolation prize of \$500 for the victor in a race to be run on the original date, November 2. The unique event had been widely advertised and because he did not wish the people to be disappointed by the postponement, Mr. Kohlsaat was prompted to additional generosity.

The consolation race attracted only two entries, the Mueller of Decatur, which was described by the newspaper reporters as a "two-seated dos-a-dos trap," and the Duryea, the result of 3 years of experiment at Peoria. The distance to be covered was 90.74 miles and the course was measured by Charles P. Root, N. H. VanSicklen and J. F. Gunther. In winning the race the Mueller consumed $5\frac{1}{2}$ gallons of gasoline. It stopped ten times on the road, losing 46 minutes in making repairs, and crossed the finishing line after 8 hours 48 minutes of strange clatter and anemic puffing.

Ordered Off Boulevard

In driving the car to the starting point, Mr. Mueller was stopped by a south park policeman and ordered off the boulevard. He sought a round-about way and reported late to the officials. Just to prove to a skeptical throng that his car would move, he drove the wonder-buggy around the Washington park track, which the summer before was in the limelight when Joe Patchen defeated John R. Gentry in 2:05 $\frac{1}{4}$. The record of the famous pacer was not even threatened, the Mueller car making the mile in about 4 $\frac{1}{2}$ minutes.

The following descriptions of the mechanical snails are quotations from a Chicago newspaper:

The Mueller is an imported car, made by the Benz people of Mannheim, Germany. It is equipped with a 3 $\frac{1}{4}$ horsepower motor, consumes a gallon of gasoline an hour, has three speeds and is capable of being stopped and started very quickly. When stopping for a short time the operators do not attempt to shut off the motor power. The belt is just shifted on a loose pulley. This is done on account of the difficulty of starting a gas engine which necessitates a man getting off the vehicle. The carriage is stopped from the front seat and by shifting the belt.

The gasoline is heated by the exhaust from the cylinder of the engine which gives a gas almost equal in power to illuminating gas, known as carbureted gas. The gas admitted to the cylinder is fired by means of an electric spark produced by a storage battery and electric coil. The Mueller wagon has wooden wheels fitted with solid rubber tires.

Appearance of the Duryea

The Duryea looked much like a single-seated road or speed wagon.

"It uses ordinary store gasoline," the "experts" of 18 years ago wrote, "and has a carrying capacity of 8 gallons. It will run from 100 to 200 miles without refilling and can speed forward and backward. It has four speeds—5, 10 and 20 miles forward and 3 miles backward. It is 3 horsepower and weighs 700 pounds."

Some of the incidents of that startling contest of November 2 are worthy of recalling now. A few days before the race, the Muellers, father and sons, went over the route and distributed tanks of gasoline and cakes of ice at different points along the course. When stops were made at these supply stations for fuel the day of the contest, chunks of broken ice were put in a receptacle on the motor to cool the engine.

In the consolation race, the Duryea broke a chain and in repairing the driving apparatus, lost the lead and 48 precious minutes. Finally the Duryea driver was forced to pull over into a ditch to avoid a collision with a road hog. This accident put it entirely out of commission.

The Duryea scored a belated triumph on

Thanksgiving Day—November 28, 1895—when it defeated five other starters in the postponed \$5,000 race and averaged 7½ miles an hour over a 54-mile course. The judges of this contest were Harry Timken, then president of the National Association of Carriage Builders; General Herrette, representing the United States army, and Professor Barrett, a Chicago electrician. Weather conditions were anything but ideal. The roads were covered with deep snow on which rain had fallen and frozen. In some places the snow and ice were strong enough to carry a man's weight.

At the close of the contest it was impossible for the judges to make a decision, as it was claimed that all the competitors had violated the rules. After a week's deliberation the following awards were announced:

Announcement of Awards

Medal-Morris & Salem electric-car, for best showing in test for absence of noise, vibration, heat or odor and cleanliness.
\$2,000—Duryea, for the best performance for speed and pull.

\$1,500—Mueller & Co., second in operation.

\$500—Macy & Co., general showing.

\$500—Sturgis, general showing.

\$200—G. W. Lewis, for friction disk and brake.

\$150—Haynes & Apperson, for plan for the prevention of vibration by balance of driving engine.

\$100—Max Hurltel, for device for starting motor from the seat.

\$50—DeLaverny, for counterbalance on engine.

Colonel Ludington of the United States army opposed any reward for model as "no vehicle showed any distinct improvements."

Commenting on the result, the Times-Herald said editorially:

"The American type of motoreycle has not yet been produced. This is not in disparagement of the many excellent designs exhibited but is a plain fact, the truth of which will be admitted by any mechanical engineer whose opinion is worthy of consideration."

The paper then sought to apologize to the manufacturer by stating that "in 4 months not much is accomplished."

On the day before the race there were eleven confident starters out of the original entrants, but on the morning of the contest there were only six cars at the starting line. Two of these—the Duryea and Mueller—finished. The conditions were broad. The motor power could be either electricity, steam, air, gasoline or oil. For testing the wagons a stand had been provided on which pulling power, cost of operation, capacity and power of endurance were demonstrated.

In the role of referee, I did not dress like the modern race official, in knickerbockers, puttees and Norfolk coat. I wore heavy arctic rubbers, extra ear muffers, heavy wraps and gloves. In each of the side pockets of my coat I stored a Brobdignagian sandwich for an emergency. Impatient, mad and terribly enthusiastic, I was up before the break of day and at the starting point.

Although not a motor car manufacturer in 1895, I was a motor enthusiast 18 years ago. I became interested in the Max Hurltel wagon because it could turn in 10 feet, started from the seat and weighed

only 220 pounds. I agreed to buy this car. At frequent intervals for several months I visited Hurltel in the loft of a west side barn where he was trying to get his wagon to move. To the best of my recollections he never got it closer to moving than it was on the day of the race when it stuttered up to the starting point and then refused to budge an inch.

In the meantime I had visited a friend in Washington who owned a steam Locomobile. This car really would move. We had several night rides, but many were the times we pushed it home. The performance of the Locomobile changed my idea of a horseless carriage and I decided to purchase a steam car. I was influenced to buy the Milwaukee and this I operated for several years.

After disposing of my Milwaukee car, I contracted for a Haynes-Apperson at the Buffalo exposition in 1901. This was changed later to the Apperson Brothers' car and was, I think, about the third machine they built. I don't believe they tried to sell me as much as I tried to buy and I must have had the "bug" quite badly at that time. The car—a two-cylinder model—was to be delivered to me in the spring, but I got it in the fall. When I told Edgar and Elmer Apperson that I intended to drive the car myself, in answer to their inquiry as to whom I had engaged as chauffeur, they informed me

that I could not operate the machine, although I had told them of my previous experience with horseless wagons.

An Early Tour

I selected Columbus as the objective point of my first trip and had the services of Edgar Apperson as relief driver and consulting companion. The Apperson proved to be a carefully assembled car and was equal to the best of that time. Of course, we had trouble and accidents, but frightening horses and drivers was our chief occupation. The frightening of horses is not a serious offense today, but we ran afoul of a farmer jury when a team left the road and ran into a fence with the result that a woman jumped, caught her foot in her skirts, fell and broke an arm.

The farmer jury, in fining me the modest sum of \$2,500, said that I was running at a speed of 40 miles an hour. Such a claim was a splendid testimonial for the car which traveled about half as fast on a steep down grade. The case was carried to the Indiana court of appeals where the verdict was finally sustained.

Fortunately for the modern motorist, the farmers of today are unlike the rural gentlemen who sought to bankrupt me. The present farmer has changed materially in a decade. He knows as much, if not more, about motor cars than the city man. Allah be praised!

Export Figures Revised by Government

WASHINGTON, D. C., Aug. 4—Revised figures on the exports of motor cars during certain periods have just been made public by the federal bureau of statistics. They show that during June last 2,039 pleasure cars, valued at \$2,023,761, and commercial vehicles to the number of 115, valued at \$167,391, together with parts, not including engines and tires, were exported to various countries.

During the corresponding month of 1912 the combined exports of passenger cars and commercial vehicles numbered 1,941 cars, valued at \$2,115,174. The shipments of passenger cars and commercial vehicles were not classified separately prior to July 1, 1912, hence the comparative figures are not available. The exports of parts, not including engines and tires, during June, 1912, were valued at \$361,835.

The year's figures show that during the fiscal year 1913, ending June 30, 24,293 passenger cars, valued at \$24,275,793, and 993 commercial vehicles, valued at \$1,737,141, were shipped abroad, together with \$5,240,599 worth of parts, not including tires and engines. The combined exports of passenger cars and commercial vehicles during the fiscal year ending June 30, 1912, numbered 21,757, valued at \$21,550,139, with parts valued at \$4,107,155.

The imports of cars increased from forty-two, valued at \$100,927, in June, 1912, to

forty-four, valued at \$105,516, in June, last, and during the fiscal year decreased from 963, valued at \$2,134,181, in 1912, to 748, valued at \$1,759,380, in 1913. The imports of parts declined in value from \$20,408, in June, 1912, to \$11,996, in June last, and from \$304,144 to \$263,827, during the year's period.

ST. CLOUD MOTORISTS TOUR

St. Cloud, Minn., Aug. 4—Twenty-four cars carried 100 participants through in the 3-day sociability tour of the local club. The first noon stop was at Silver Lake and the night control was at Mankato. The second noon stop was at Northfield and night stop at Red Wing. Thursday was spent in the Twin Cities with the return to St. Cloud for the night. At Mankato houses were open for entertainment owing to the closing of the big hotel for repairs and a reception was given. Two cars dropped out on the way leaving the full twenty-four to make the round trip.

ST. PAUL MOTORISTS TOUR

St. Paul, Minn., Aug. 4—Nearly 100 cars took part in the sociability run of the Automobile Club of St. Paul, Thursday, to Stillwater, Hudson, Wis., New Richmond, Wis., and back to the White Bear club house for supper, and the return afterward to the city.

Routes and Touring Information

From Des Moines to Washington, D. C., and Back for \$425



NEW BRICK ROAD FROM BUFFALO TO NIAGARA FALLS, FRANK LEEDS' ROUTE

ONE blowout, two punctures, no engine trouble, 375 gallons of gasoline, 3,468 miles travel, 35 running days, total expense, \$425—that's the record of Frank J. Leeds, a piano dealer of Des Moines, Ia., who completed this long tour July 13.

Deeply interested in the possibilities of touring and a great advocate of "home sight-seeing," Mr. Leeds decided to spend his first real vacation in investigating the practicability of traveling by motor car in America with reference especially to expense, pleasures derived and adaptability of the machine as a means of transportation.

Beginners' Fears Overcome

Leeds had not had a vacation in many years and he longed to spend about 2 months in recreation. He had owned a car for some time, but the oft-repeated story that "a motor car is a rich man's toy" had tended to divert any thoughts he might have entertained of touring through the country. However, a friend suggested an overland run to Chicago, New York and Washington, D. C., and Leeds consulted as to its practicability.

Like the average motorist, the expense proposition did not look inviting at first glance. He feared broken axles, punctures, blowouts, and all kinds of car trouble not consistent with real pleasure. The hotel expense was another item. The run would carry him into strange places and the numerous tales of "hold-ups" by village stories and "guides" frequently had reached his ears. Leeds deliberated over the feasibility of the trip and decided that it would not be necessary to stop at the

best hotels in the cities visited, and this important item of expense would be materially reduced.

So, accompanied by his wife, and with a little more than \$500 in his pocket, he left Des Moines on May 13 in a four-passenger 1913 Cadillac, fully equipped with top, electric self-starter, tool kit, windshield and extra canvas cover over the back seat to protect baggage for a tour of the middle west and east. He was gone exactly 2 months, although he was on the road only 35 days, spending 2 weeks in Washington, D. C., and visiting relatives and friends in various cities.

To insure accuracy in his observations, Leeds conceived the novel idea of keeping

a daily record of his trip, logging it and carefully noting the hotel expense, repair expense, cost of garage facilities and cost of gas. The diary also contained such other comments as condition of roads, needed legislation and enforcement of the speed and traffic laws. The road question and law enforcement problem were given special attention.

Start Made with \$535

The idea so firmly planted in the forehead of many that the motor car is only a rich man's fad is a fallacy, according to Leeds, and he has the facts at hand to substantiate his statements. He departed from the Iowa capital with exactly \$535 in his pockets. He returned 2 months later, after

LEED'S Daily Bulletin, Des Moines, New York, Washington, D. C., Tour

Date May 17/13
 Left Michigan City Ind 5:10 A. M.
 Arrived South Bend - 6:30 am P. M.
 Traveled To-day 227 Miles
 Day's Expense—Gas \$4.70 Oil —
 Work on Car —
 Hotel Super 40-2 Street —
 Incidentals Stopped at Hoffman
Hotel - 2.00 for dan for room
for 2 - bath =

News of Trip Each Day

Five P.M. roads - weather
 Cool - cloudy - No rain -
 Average travel fair - Could
 make 40 mile many places
 lots of the road we ran
 35 miles per hour for
 miles & miles!

SAMPLE OF DAILY LOG KEPT BY MR. LEEDS



ROUTE FOLLOWED BY LEEDS FROM DES MOINES TO WASHINGTON, D. C., AND RETURN

having traveled almost 3,500 miles, had enjoyed theatrical amusements and the pleasures afforded in the national capital, attended the reunion of civil war veterans at Gettysburg and had \$110 left. His car was in good condition and he had no tire trouble to speak of. Yet Leeds had succeeded in enjoying a real vacation and had a knowledge of roads, driving and legislation which he could have secured in no other way.

The tour which carried him through Chicago and Detroit and the principal cities of the east, including New York, Philadelphia, Buffalo, New Haven, Brooklyn and Washington, D. C., had cost him slightly more than 12 cents a mile. This includes hotel expenses. He consumed 375 gallons of gasoline on the trip, a gallon for approximately every 10 miles. His best day's run was 250 miles, made between Greensburg, Pa., and Newcomerstown, Ind., and he now is confident that he can spend all the money he desires and make the trip again on \$300.

Preparations for Start

Like the majority of the thousands of car owners, he was totally ignorant of the various routes for travel. He knew little of road conditions in the west or east. He knew less about the preparations necessary for so extended a trip as he contemplated. It was a very natural thing for him to accept suggestions. The first thing he did was to visit a local railroad office where he secured a New York Central guide book. He then traced his route on the map and secured additional information from Motor Age.

Suggestions from local motorists poured in thick and fast. Dealers also were liberal in handing out their bits of advice. Leeds noted these suggestions and carried out many. He attributes his single blowout and little tire trouble to a suggestion that he measure the air pressure in the tires. He did this every time he injected the ozone into the tubes and was careful that the pressure in the front tires did not exceed 65 pounds and in the rear, 75. He also allowed for heat expansion.

Leaving Des Moines, Ia., the start was over the transcontinental route in the direction of Chicago. He traveled at a fair rate but a rain which converted

the Iowa dirt roads into seas of mud forced him to ship his car from Marshalltown to Chicago by rail. Leeds was sharp in his criticism of the Hawkeye

roads and the methods of road improvement. The roads had the appearance as though scrapers had been used and ridges were left in the middle, making it dangerous for

Itinerary from Des Moines, Ia., to Washington, D. C.

Time consumed on trip.....Two months
Number of running days.....35
Number of miles traveled.....3,468
Amount of gasoline consumed...375 gallons
Cost of gasoline.....\$ 75.00
Garage expense.....30.00
Shipping car to Chicago.....54.00
Shipping car to Buffalo.....10.00
Hotel expense.....255.50
Number of persons in car.....Two
Punctures on trip.....Two
Blowouts.....One
Engine trouble.....None

May 13—Left Des Moines at 5:20 a. m., arrived in Marshalltown, Ia., 3 p. m.; mileage, 70. Day's expense—gasoline, \$1.40; work on car, 25 cents; hotel, \$1.70; total, \$3.35. Weather cold. Lost one chain. Rain forced shipment of car by rail to Chicago.

May 16—Left Chicago at 2:30 p. m., arrived in Michigan City, 6:30 p. m.; mileage, 35. Day's expense—gasoline, \$2.80; work on car, 50 cents; hotel, \$1; garage, 50 cents; total, \$4.80.

May 17—Left Michigan City at 5:10 a. m., arrived in Detroit, Mich., 6:30 p. m.; mileage, 227. Day's expense—gasoline, \$4.70; hotel, \$3.40; total, \$8.10. Fine plke roads.

May 18—Spent day in Detroit. Day's expense—gasoline, \$1.40; washing car, \$1.50; change tire, 50 cents; hotel, \$3.75. Drove over beautiful city drives.

May 19—Left Detroit at 5 p. m., boat, arrived in Buffalo, N. Y., 7 a. m. More economical to take boat for Buffalo than make detour.

May 20—Drove to Niagara Falls. Mileage, 65. Day's expense—gasoline, \$1.10. Drove over new brick pavement just completed.

May 21—Left Buffalo at 5:25 a. m., arrived in Utica, N. Y., 6 p. m.; mileage, 223. Day's

expense—gas, \$2.39. Averaged 30 miles an hour.

May 22—Left Utica at 6:25 a. m., arrived in Little Falls, 7:25 a. m.; mileage, 25. Day's expense—work on car, 50 cents. Rain caused tourists to stay in Little Falls.

May 23—Left Little Falls at 6 a. m., arrived in Huntington, 6:30 p. m.; mileage, 141. Day's expense—gasoline, \$5.21. Climbed Jacob's Ladder near Lenox. Scenery grand.

May 24—Left Huntington, Mass., at 2 p. m., arrived in Worcester, Mass., 6 p. m. Day's expense—gasoline, 88 cents. All state roads to Worcester.

May 25—Left Worcester at 5:30 a. m., arrived in Providence, R. I., 8 a. m.; mileage, 45. Day's expense—gasoline, 88 cents.

May 26, 27, 29—Spent in Providence and Newport. Total expense, \$7.30.

May 30—Left Providence at 1:20 p. m., arrived in New Haven, Conn., 6:45 p. m.; mileage, 117. Day's expense—New London ferry, 36 cents; bridge toll, 55 cents; hotel and incidentals, \$4.10; total, \$5.06.

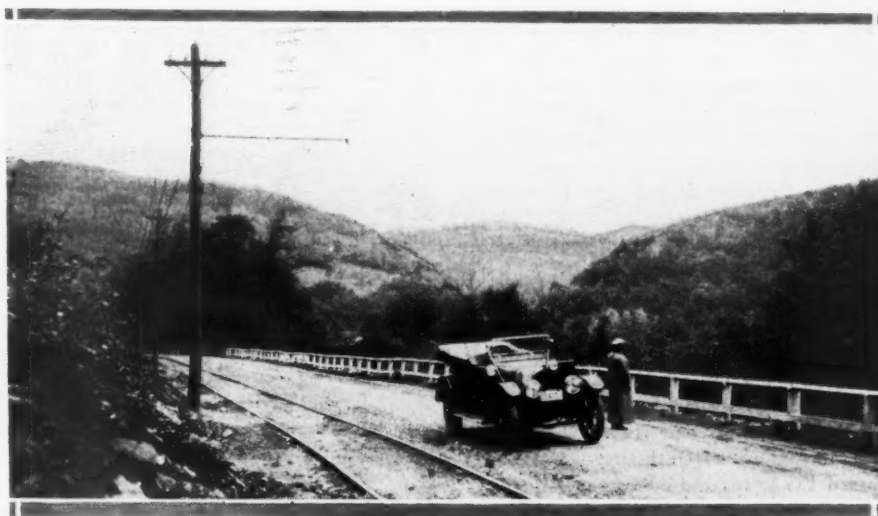
May 31—Left New Haven at 5:30 a. m., arrived in New York at 9 a. m. and in New Brunswick, Conn., 5 p. m. Day's expense—gasoline, \$6.20; garage, \$1; hotel, \$2.50; total, \$9.70.

June 1—Left New Brunswick at 5 a. m., arrived in Atlantic City 1:30 p. m.; mileage, 100. Day's expense—gasoline, \$1; garage, \$1; hotel, \$3; total, \$5.00.

June 2—Spent day in Atlantic City. Day's expense—gasoline, \$3.36; garage, \$3; hotel, \$11; bathing at beach, etc., \$5; total, \$22.36.

June 4—Left Atlantic City at 5 a. m., arrived in Washington, D. C., 7 p. m.; mileage, 200. Day's expense—garage, \$1; hotel, \$3.50; incidentals, \$1; total, \$5.50.

No accurate record kept on return trip.



TOURING THROUGH MOUNTAINS AFTER LEAVING ALBANY, EVERY ROAD IS SAFEGUARDED BY A RAILING

travel in the wet season. All the roads west of Chicago were not in the best of condition at the time and only stretches of gravel and pike every now and then were encountered.

From Chicago, Leeds drove to Michigan City, Ind., going by way of Gary and covering the run easily in a day. South Bend was the next stop and the 40-mile spin was made over a pike road. The tourists did not delay long in South Bend, heading for Detroit. They followed the route through Mishawaka, Elkhart, Middlebury, How, Coldwater, Clinton and Ypsilanti. The roads were in splendid condition and a drive of 227 miles was made on a Friday. The farther east Leeds toured, the better the roads, and this 227 miles in 1 day was no record-breaker.

The boat was taken at Detroit for Buffalo. The first puncture of the tour occurred shortly out of Buffalo. Another tire was quickly slipped on and a blacksmith earned 50 cents by aiding the tourists. After a few minutes' delay, the journey was continued.

One thing especially made a great impression on Leeds and that was the strict enforcement of the speed laws in the east. In direct contrast to the general lax enforcement in the west, the east exercises special precautions to prevent speed wizards from endangering the public places of travel. Through the various small towns, cards are nailed to posts bearing inscriptions, "This is an incorporated town, speed limit 2 to 12 miles," and the speed limit generally in New England is from 30 to 35 miles an hour in the country.

The Leeds' spent several hours at Niagara Falls, where they inspected the far-famed scenery. A brick pavement connects Buffalo with the Falls and there are no complaints from motorists on road conditions. The tourists reached New York, their first eastern destination, by way of New Haven. Leeds crossed the Brooklyn bridge and passed through Brunswick, Trenton, Philadelphia, Baltimore, and on July 4, 3 weeks from the time of his departure from Des Moines, he arrived in Washington, D. C., where he spent 2 weeks sightseeing.

On the Homeward Journey

As Washington was the terminus of his tour, Leeds was in no great hurry in starting on the return trip. He indulged in pleasure drives over the city boulevards and good country roads.

The famous field of Gettysburg was the next stop on the Leeds' itinerary, and the scene of the great battle was closely inspected. The tourists praised the manner in which the government prevented hold-ups by guides and the many courtesies extended by government officials to aid the visitors in finding their way.

After a week at Gettysburg, the Leeds crossed the seven ranges of the Allegheny mountains, ascending to the summits, and made the trip to Greensburg, Pa., in a day. The roads were rough and Leeds was forced

to use intermediate speed owing to the steepness of the ranges. Pittsburgh followed Greensburg and it required 2 hours for Leeds to find his way out of the Smoky City. He finally encountered a road known as the Steubenville pike and crossed the Ohio into Steubenville on July 3. He arrived in Richmond, Ind., and was greeted with a blowout. The heat was intense and the roads were bad on account of the recent floods.

The tourists struck the national pike and enjoyed a fine drive from Columbus through Springfield, Cambridge, Indianapolis, Frankfort, Lafayette, to Crown Point, Ind., a distance of 220 miles. The second puncture at this point caused slight delay and then Chicago was reached on July 7. The tourists laid over in the Windy City for a stay and traveled homeward at an easy pace, consuming two days in making the trip.

ENJOYABLE EUROPEAN TOUR

Six weeks of touring in Europe over 3,000 miles in Italy, France, England and Wales was a journey recently completed by F. H. Wellcome, of Minneapolis, in a White six seven-passenger touring car. Mr. Wellcome was accompanied by five passengers and a chauffeur and his car carried six suit cases in addition to a trunk in the rear. Speeds as high as 65 miles an hour were made on some of the fine roads in southern and central France.

Mr. Wellcome shipped the car to Naples and drove to Rome, where 4 days were

spent in touring among the outlying villas and driving over the historic Appian way. From Rome, the party toured over many of the mountain roads leading to Florence and then followed the shore drives along Genoa bay to Genoa and Nice. Three days were devoted to side trips from Nice to Trasse, Mentone and Toulon. From the latter city he drove to Marseilles and Avignon, crossing the Cevennes mountains into the chateau country and visiting La Chatre and Tours.

Side trips also were made from Tours to see many of the castellated old French mansions at Chenonceaux, Amboise, Chambord, Chaumont and Blois. Visits were made to some of the villas at Orleans and the palaces and forests of Fontainebleau. From Paris the car was driven to Versailles, where the party was joined by Dr. Wellcome.

Returning to Paris, they set out for Boulogne and crossed the straits to Folkstone and London. After spending 3 days touring in the vicinity of Oxford, Henley, Coventry, Stratford, Warwick, Kenilworth and Chester, they drove through the valley of Dee to Dongelly in Wales. From this point they turned south and motored to Abergavenny, Bath and Southampton, where they sailed for New York.

The longest day's run was 175 miles crossing the mountains between Avignon, on the Rhone river, and the town of Ambert. When they arrived in New York, the homeward journey was made by way of the Berkshire hills and the Mohawk valley.

Answers to Many Inquiries for Routes

St. Joseph, Mo.-Humboldt, Neb.

S. T. JOSEPH, MO.—Editor Motor Age—Kindly publish the best route to Humboldt, Neb., the towns passed through and the total distance.—E. C. Maxwell.

Go to Hiawatha almost straight west from St. Joseph, 42 m., through Troy, Manning and Highland, mostly good dirt road. From Hiawatha go north 18 m. to Falls City and there turn west through Salem and Dawson to Humboldt, 20 m.

Joplin, Mo.-Yellowstone Park

Joplin, Mo.—Editor Motor Age—I would like to know the best route to take in traveling to Yellowstone national park. Also kindly advise the distance and the time it would take to make the trip. Are cars allowed to travel through the park?—J. C. Watkins.

Going west to Wichita the towns are Cheyenne, Edna, Valeda, Coffeyville, Tyro, Caney, Niotaze, Peru, Sedan, Wanita, Cedar Valley, Hoover, Dexter, Winfield, Udall, Mulvane. The Santa Fe trail then is available, routing 214 m. to Dodge City, through Colwich, Mt. Hope, Haven, Elmer, Hutchinson, Sterling, Lyons, Ellinwood, Great Bend, Kinsley and Spearville; Dodge City to Syracuse 107 m. via Cimarron, Ingalls, Garden City and Kendall; Syracuse to Pueblo 181 m. via Lamar, Las Animas, La Junta, Rocky Ford and Orchard park; Pueblo to Colorado Springs 43 m., through Bragdon, Buttes, Fountain; from Colorado Springs go north to Denver 69 m. via Palmer Lake and Sedalia; Denver to Cheyenne 110 m. via Longmont, Berthoud and Fort Collins.

The natural place to start for the park is from Cheyenne. Motor Age understands that it is possible to drive to Cody, although there are as yet many stretches of very rough going. In general your route goes to Douglas 152 m. and from Douglas west through Casper to Shoshone and then north to Basin and west to Cody. There also is a possibility that better roads may be found by continuing west from Shoshone through Lander to Pinedale and then north through Wells and Jackson to the southern entrance

of the park. Until the park is actually open for motor travel the various projects of establishing a thoroughly good road to either the south or eastern entrance of the park will not be realized, although from present indications it looks as though the park would be open for travel next year.

Clearbrook, Minn.-Kingsville, Mo.

Clearbrook, Minn.—Editor Motor Age—Kindly give me a route to Kingsville, Mo., via Fosston, Minn., Kansas City and Lee's Summit, Mo.—I. D. Kretser.

On the first part of your trip Motor Age has no specific data and would welcome any information from people who may be familiar with this section. From our general knowledge of that part of Minnesota we believe you will find it advisable to come west from Clearbrook to Crookston, although if you are particularly desirous of going to Fosston you might be able to get a direct route from there to Fargo. If you go to Crookston first you will find fairly good natural dirt roads down the valley of the Red River to Fargo; from there on your road conditions should be even better with good going all the way to Kansas City. We recommend the following:

Fargo to White Rock 79 m. This is a section of the Meridian Road, passing through Christine, Abercrombie and Wahpeton. From White Rock we advise going to Brookings, S. D., 133 m., via Clinton, Ortonville, Milbank and Clear Lake; Brookings to Sioux Falls 57 m., via Dell Rapids; Sioux Falls to Sioux City 95 m., via Canton, Hawarden and Westfield; Sioux City to Omaha 109 m., via Anawa and Missouri Valley; Omaha to Hiawatha 123 m., via Nebraska City and Auburn; Hiawatha to Kansas City 99 m., via Everest, Atchison and Leavenworth.

From Leavenworth the road is almost straight south to Belton, 20 m., and from there east through Pleasant Hill to Kingsville. To reach Lee's Summit would advise your returning from Kingsville to Pleasant Hill and from there go north through Greenwood to Lee's Summit. If you are coming back into Kansas City we believe you should

find a fairly good road almost straight north from Lee's Summit to Independence, where you strike a macadam road into Kansas City.

Between Sioux City and Omaha you have an option of a road on the west side of the Missouri going through Nebraska 113 miles by way of Homer, Winnebago, Walthill, Oakland, Craig, Tekamah, Herman, Blair and Florence. It is longer, however, by 4 miles.

Chicago to New York and Return

Chicago—Editor Motor Age—Kindly give the best route to New York returning by way of Philadelphia, Gettysburg and back to Chicago.—J. E. Cunningham.

The most traveled road is as follows: Chicago to Cleveland via Valparaiso, La Porte, South Bend, Goshen, Ligonier, Kendallville, Bryan, Napoleon, Bowling Green, Woodville, Fremont, Bellevue, Norwalk, Elyria; Cleveland to Buffalo routes through Willoughby, Painesville, Geneva, Ashtabula, Conneaut, Girard, Erie, Ripley, Westfield, Brocton, Fredonia, Silver Creek, Irving, Evans. Information on the Buffalo-Philadelphia road is contained in the issue of May 8, page 24, and also gives the points of interest enroute.

Philadelphia to Gettysburg is 119 miles over a middling fair toll road via Bryn Mawr, Devon, Malvern, Downingtown, Coatesville, Lancaster, Columbia, Wrightsville, New Oxford, and a good but mountainous road leads through McKnightstown, Cashtown, Chambersburg, Ft. Loudon, McConnellsburg, Breezewood, Everett, Bedford, Kantner, Ligonier, Youngstown, Greensburg, Adamsburg, E. McKeesport, Wilmerding and Wilkensburg.

You can route to Cleveland from Pittsburgh via Glenfield, Rochester, Beaver Falls, Darlington, Youngstown, Warren, Chagrin Falls and Randall, then return to Chicago over the same road as on the going trip, or, you can route to Columbus, O., then Lima, Ft. Wayne, South Bend and Chicago.

For this latter run your best road to Columbus is not over the National pike. You should route through Clairton, Elizabeth, Fayette City, Brownsville, Centerville, Beallsville, Bentleysville, Canoeville, Church Washington, Claysville, W. Alexander, Elm Grove, Wheeling, Colerath, Pleasant Grove, Harrisville, Science Hill, Cadiz, Lacyville, Philadelphia roads, Uhrichsville, Gnadenhutten, Port Washington, Newcomerstown, W. LaFayette, Coshocton, Adam's Mills, Trinway, Frasesburg, Hanover, Newark, Granville and Columbia Center.

The run to South Bend is over a very good road, being 89 miles to Lima through Marysville, Zanesfield, Bellefontaine, Huntsville, Westminster, Lima; 63 miles to Ft. Wayne via Delphos, Van Wert, and 79 miles to South Bend, the road lying through Churubusco, Ligonier, Goshen and Mishawaka, then 100 miles to Chicago through La Porte, Valparaiso, Merrillville, Gary and Whiting.

Fort Wayne, Ind.—Saginaw, Mich.

Fort Wayne, Ind.—Editor Motor Age—I am desirous of making a trip through the state of Michigan as far north as Saginaw, but I have been told it is impossible to get as far north as that on account of the poor condition of the roads. Some time ago I read in Motor Age of a 1-day road-building picnic where they built a road from Alpena to Saginaw, but a road built in such a short time I imagine would be very poor for a car to negotiate. Kindly give me this information as to the roads leading through the state, either along the east or west part or both.—George H. Louch.

If you are starting from Fort Wayne to Saginaw, you will find for the most part very good roads, going to Detroit 171 m., via Defiance, Napoleon, Wauseon, Adrian, Clinton and Ypsilanti. Detroit to Saginaw 92 m., via Pontiac, Waterford and Flint.

There has been a movement on foot to make an improved road suitable for motor travel north from Saginaw and Bay City through Alpena to Mackinaw. The article to which you referred is in relation to practically the first work done by the people along this route to get it in good shape. Just how much has been accomplished and in what condition the road is at present we are not prepared to state, as it goes through a section of Michigan that heretofore has had very little travel by the motorist. However, you can reach northern Michigan, if that is one of your objective points, by a fairly good road, going west and north from Saginaw to Cadillac 131 m., passing through Merrill, St. Louis, Mount Pleasant, Sherman City, Barryton and Ewart; Cadillac to Traverse City 53 m., via Manton, Sherman and Wexford; Traverse City to Petoskey 60 m., via Milton Center, Trout Lake and Charlevoix. You will also find a good road from Petoskey to Mackinaw 38 m.

If you are coming back to Grand Rapids your best route is to turn through Cadillac to Barryton and then into Grand Rapids via Lakeview, Greenville and Rockford. There is another route a little longer that is fairly good, going from Traverse City to Manistee via Copemish and then down the shore to Muskegon and into Grand Rapids.

Road Conditions in Eastern Territory

Massachusetts

NEWBURYFORT TURNPIKE—This road between Newburyport, Mass., and Boston, which has been closed to traffic while repairs were in progress, is now open, and is in excellent condition. It is recommended to all tourists as the best route between Boston and Portland.

Newburyport to Boston via Salem—Work is being carried on at two or three points along this highway, but no detours are necessary, as the road is being kept passable and no single stretch of work is over one-half mile in length.

New Hampshire

White Mountain Roads—The roads in the vicinity of Bretton Woods have been put in good shape again. The road through Crawford Notch is good. The road from Twin Mountain to Franconia Notch is better than last year, but the road from the Profile House through Franconia Notch is not as good, although by no means bad.

Rhode Island

The state board of public works of Rhode Island has just issued the following bulletin for motorists relative to the condition of various roads in that state:

Reservoir avenue, city of Cranston—The road from Park avenue south to the bridge over the Pocasset river is being resurfaced and broken stone put on to reshape road.

North Kingston to Narragansett Pier—Men are at work finishing up resurfacing work at a point about ½ mile north of the turn into Wickford.

Warwick to Narragansett Pier—Men are at work ¾ of a mile south of the village of Apponaug scarifying and putting on broken stone. Motorists should take due care and pass on side.

Silver Hook road—The bridge over the Pawtuxet river is closed to travel. Motorists going through to Warwick Neck and places on the east shore should continue on down Broad street through the village of Pawtuxet.

Warren avenue and Pawtuxet avenue, East Providence—Both these roads are being repaired. Vehicles can take to car tracks on either side, but it is very dusty. Motorists should take the Barrington Parkway and go around the construction work.

Bristol—Main road to Bristol and the Newport ferry is torn up about ½ mile north of the village of Bristol and being resurfaced. About 150 feet is torn up.

Tiverton—The road to Sakonnet and Newport is torn up about 4,000 feet south of the line between Fall River and Tiverton. Watchmen at either end will direct motorists where to go.

Woonsocket to Greenville—This road is being newly constructed and is torn up in two places, one section in North Smithfield, south of Primrose, and the other near Smithfield station. Road is passable, but rough going.

Danielson Pike—This road, for 1 mile west of Hopkins Mills, is very rough and a ledge is being excavated from the roadway. Motorists should go around by some other way.

Hope Valley to West Kingston—This road is under construction at the village of Usquepaug and is passable, although rough for a short distance.

Putnam pike—Macadam construction on the Rhode Island side of the line is complete, but 2½ miles on the Connecticut side is torn up and impassable. Motorists going through to Connecticut should take road to left at West Gloucester and go around road that is torn up.

Providence, Washington, Noose Neck Hill, to Hope Valley to Westerly—Macadam road completed all way.

Washington, Coventry Centre, Summit, Greene, to Oneco, Conn.—Macadam road completed all way.

Plainfield pike—About 7 miles of the road from Thornton is completed and next 2 miles west are under construction; rough but passable.

Maine

Brunswick to Augusta via River road—This road is decidedly rough in places with many ledges protruding above the surface. There is a fine stretch of road running north from Gardiner and running for a short distance out of the city. The road gets rough again after this section is passed.

Portland to Augusta via Lewiston—The best route between Portland and Augusta at the present time is that by the way of Gray, Danville Junction, Lewiston, Green, Winthrop and Manchester. This road is now in good condition along most of its length. For the most part it is wide and smooth, the only notable exception in the case of width being the stretch of 2 or 3 miles south of

New Gloucester. The new state road work being done by Auburn on the road between that city and Danville Junction has been completed. This highway is now in fine shape. The road from Lewiston to Green by the way of Main street, Lewiston, is closed to travel while repairs are in progress, and traffic is advised to take Sabattus street to College street, and follow College street to Green.

Biddeford to Biddeford Pool and Kennebunkport by Shore road—This road is now very rough for almost the entire distance. Traffic over this route can get along fairly well by proceeding slowly.

Portland to Kennebunk—The road from Portland to Kennebunk, over the regular Boston turnpike, is now in excellent shape for almost its entire length.

Brunswick to Bath—For the first 2 or 3 miles out of Brunswick this road is very sandy and rough. The last end of it, however, into Bath, is excellent.

Portland to Bethel—The best route between Portland and Bethel at the present time is via North Windham, Raymond, Naples, Bridgton, North Bridgton, Waterford, North Waterford, Albany Townhouse and the west shore of Songo Pond. All of the routes between Portland by Bethel by the way of Poland Spring are not in the best of condition at the present time. After leaving Poland Spring, the roads are inclined to be somewhat sandy and rough at intervals.

Portland to Fryeburg—Road from Portland to North Windham, fine; North Windham to Bridgton, fair; Bridgton to Fryeburg, good.

Portland to Brunswick—The road from Portland to Brunswick is somewhat rough at the present time. Detour around Veranda street, East Deering, while road work is in progress.

Northern Piscataquis County—Travel to Houlton between Mattawamkeag and Benndicta should take the road branching north at Molunkas, rather than the Silver Ridge road, as road work will soon be begun on the latter highway.

Newport to Bangor—Traffic into Bangor from southern and western Maine is recommended to use the road by the way of Stetson between Newport and Bangor, rather than the main highway through Etna, as the latter is now in poor condition. The Stetson road is only two miles further.

Bath to Hockland—This important highway is reported to be in bad condition about two miles west of Waldoboro village.

Aroostook County—The old military road via Haynesville is in poor condition, and traffic is recommended to go to Houlton by the way of Fatten.

Quebec, New Brunswick, Maine

The following information from a motorist who toured through Quebec and New Brunswick from Maine is interesting, for it describes new motoring territory.

"From Jackman, Me., to the Canadian boundary the roads are excellent. In Canada from the line to St. Come they were working on the road and it was rough on account of turf being left in the road. St. Come to Valley Junction, roads are good. Valley Junction to Currier Junction to Levis, roads continue excellent. We arrived at Quebec at 6 o'clock, 105 miles from Jackman. Remained 2 days in Quebec, taking motor trips 20 miles to St. Anne de Beaupre, roads excellent. Took 2 hours for round trip. Left Quebec at 2:30 p. m. for St. Pamphile, 1 mile from state of Maine, 32 miles from St. Jean Port Joli. Roads all along the St. Lawrence river excellent. Took 6½ hours running time, Levis to Riviere de Loup, 120 miles. Left St. Pamphile at 11 o'clock and went to Riviere de Loup for supper.

"It rained hard next morning, nevertheless we started for Van Buren, Me., 105 miles, getting there at 5 o'clock in the afternoon. Roads from Riviere de Loup to St. Honori excellent. St. Honori to Cabino rough on account of sod being used in the road construction. Cabino to Edmundston, N. B., roads excellent and beautiful scenery. Edmundston to Van Buren, on American side of the St. John river, men working on roads in places, but the road was generally good.

"Since returning to Van Buren have made a trip back over the above mentioned roads to Edmundston, N. B., and Notre Dame du Lac and return to Van Buren. The roads then were excellent. Today I left Van Buren at 10:30 a. m. and am going to St. Francis, Me., by St. John river road and returning to Ft. Kent, Me., for dinner. Road excellent, improving the farther we go up the river. Left Ft. Kent after dinner by Caribou road to Stockholm, thence by Caribou road to Van Buren, Me., arriving at 5 p. m. Roads excellent except in the woods eight miles before reaching Van Buren. Men at work on the roads there."

Questions Answered and Communications Received

James S. Scarsi...Wichita Falls, Tex.
A Subscriber...Clinton, Ia.
J. S. Adams...Detroit, Mich.
Don I. Shepherd...St. John, Kan.
James K. Stafford...Decatur, Ill.
R. A. Hoyt...Lake City, Minn.
R. L. Nelson...Sapulpa, Okla.
H. E. F. Schurz...La Crosse, Wis.

Cyclecar Section

Cyclecar Observer...Seattle, Wash.
Herman Bernard...Brooklyn, N. Y.

No letters not signed with the writer's full name and address will be answered.

BOOKKEEPING SYSTEM FOR GARAGE

Reader to Handle Cars, Repair and Do Vulcanizing

WICHITA FALLS, Tex.—Editor Motor Age—I am looking for a good system for keeping accounts in a garage which sells cars, has a complete vulcanizing plant and does general repair work. Can Motor Age help me to find or devise such a system? Have had practical shop experience and some office experience, but want to get hold of a system that will do away with all unnecessary work in the various departments.—James S. Scarsi.

In 90 per cent of the garages in Chicago the double entry bookkeeping system has been installed. With this as a basis, other minor systems are put into practice, but since these systems vary with each garage owner's ideas, one of the best and most successful will be here given.

Let us first discuss the sale of cars. As soon as prospective customer is found, a card is made out in his name and all the labor necessary to sell the car is placed on the card. Thus, if it took a salesman 40 hours to sell the car and the salesman's salary was 60 cents per hour, the card would show \$24 on the left side. If the car is sold, the price is entered on this card and the difference between it and the cost of selling is the real selling price. This card is kept for an entire year, for the cars are guaranteed for a year. All the labor and parts necessary to keep the car in repair under the guarantee is placed on this card and at the end of the year the card tells exactly how much was made on the car. The entries from the card are transferred also to a ledger headed "car sales," so that any time in the year the profit on all or any of the cars sold up to date may be approximated. If the car is not sold the labor is charged to loss.

As to repair work done in the shop. At the beginning of each day, each workman receives a card upon which he writes the time spent on each job. At the end of the day, the sum of the times spent on the various jobs must equal 9½ hours, or a full working day. As soon as a car comes

The Readers

into the shop for repairs, it is tagged and upon this tag is written the work to be done upon the car. For example, a tag on a car may read, "straighten steering knuckle, grind valves and adjust clutch." Each of these jobs is done by a workman and as the work is finished it is crossed off the card and dated. When the job is complete the bookkeeper receives the card. He previously has entered the time required by each man to do his share of the work, therefore he can tell the amount of time spent on the whole job and can charge accordingly. If any parts are replaced these too are marked on the tag on the car. A record of this is kept also in the stock room. The stock book at the end of each day must tally with the cards of the different cars. Suppose the stock room book showed that fifteen different parts were given out, then these parts must show on the tags on the different cars.

The vulcanizing and overhead accounts do not deviate from the conventional.

DETAILS OF ARGYLL SLEEVE MOTOR

One Moving Part Has Rotational as Well as Up and Down Motion

Clinton, Ia.—Editor Motor Age—I would like to know the arrangement of the construction of the Argyll's elliptical sleeve valve which they use on their single sleeve valve engine.

2—Is the motor as silent as the Silent Knight sliding-sleeve motor?—A Subscriber.

1—Fig. 1 at the left shows a transverse section in which the sleeve S will be noted, occupying the annular space between the piston and the cylinder wall. Its action is peculiar in that the motion imparted to it is not merely up and down but is also partly rotational. This will be made clear by reference to the illustration at the

right, which shows the sleeve and its operating mechanism detached from the engine. The reciprocation of the sleeve is effected by the action of a small crank C which has a sliding fit in the rotating member D. This latter is carried in the bearing B, which is bolted to the crank casing wall. The operating shaft A, which is equivalent to and occupies the same position as the camshaft in the poppet-valve type of engine, is provided with four worms or skew gears, one at each cylinder, which engage with teeth on the rotating member D, driving it at half the speed of the crankshaft. This reduction takes place at the skew gearing, the camshaft itself running at the same speed as the engine shaft by silent chain. Two revolutions of the engine shaft, therefore, cause a single revolution of the actuating crank C, which in turn imparts such a motion to the sleeve that any one point on its outer surface will have traveled through an elliptical path on the cylinder wall. This peculiar motion is the fundamental principle of the Argyll valve. It permits a complete register of opening of the valve port P with the corresponding ports in the cylinder wall while the sleeve is traveling in one direction and a complete closing on the opposite stroke.

2—It compares favorably with the Knight in the matter of silence.

OPERATION OF MAGNETO EXPLAINED

Both High and Low Tension Described—Set Spark

Detroit, Mich.—Editor Motor Age—Kindly explain by diagram the operation and circuit of a magneto.

2—Does it produce an alternating or a direct current?

3—Why is the breaker necessary and how does it work?

4—Why is a breaker not necessary on battery ignition?

5—What are the advantages and disadvantages of a set spark magneto?

6—Describe the dual system—J. S. Adams.

1—There are two types of magnetos in use, low-tension and high-tension. The former is one which produces initially a low-tension or low-voltage current and the latter produces a high-tension current. The construction and operation of a magneto follows.

A magneto is nothing more than a dynamo. If you were to revolve a coil of wire on an iron core between the poles of a magnet there would be generated in the coil a current of electricity. A magneto may be said to be a generator of electricity and

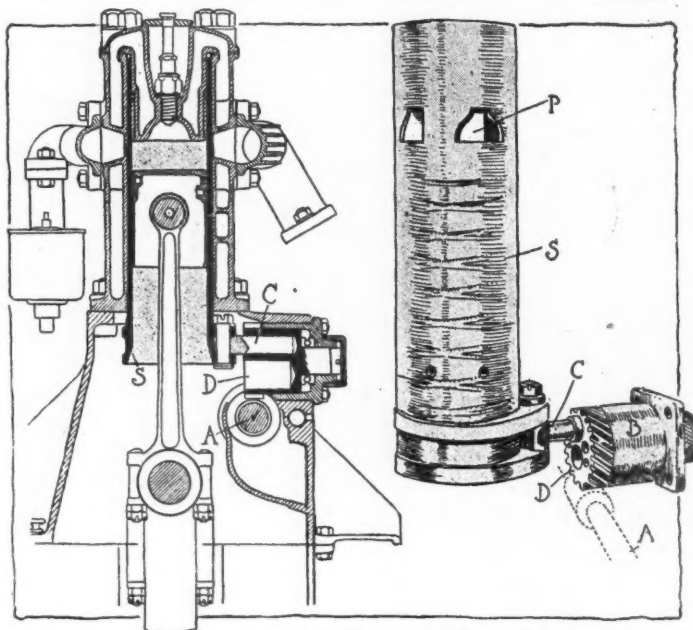


FIG. 1—TWO VIEWS OF ARGYLL SLEEVE MOTOR

Clearing House

consists of a permanent magnet which has operating between its poles an armature or coil of wire wound on an iron core.

In Fig. 2 is shown the construction of the low tension magneto. It will be noted that between the poles of the magnet there is a spool shaped device called an armature. For simplicity's sake only a few turns of wire are shown, but in the magneto there are many turns. One end of the winding is attached, as will be noted, to what are called breaker points, and the other end of the winding is attached to the shaft upon which it is wound. In other words, it is grounded. The reason for this will be seen later. The other end of the breaker points leads to what is called a coil, sometimes called a transformer coil or step-up coil. This consists of a piece of soft iron around which is wound comparatively few turns of heavy wire. This first winding is insulated and over the insulation is wound many turns of fine wire. The first winding is called the primary winding and the second, the secondary or high-tension winding. If a current of electricity is passed through the inside or primary winding and then this current suddenly stopped or interrupted, or broken as is said, there will be induced or set up in the secondary coil a current of high voltage.

The armature of the magneto is geared to the motor in some way. As the armature revolves a current of electricity is set up or generated in the winding of the armature. This current leaves the armature and goes to the breaker points. Now, these points are made to open and close by a cam, shown in the illustration. When the points are together then the current will flow to the primary winding of the outside coil. But as soon as the points separate the circuit is broken. As stated before when the circuit is broken a high-tension or high-voltage current is set up

in the secondary coil. To go back to the current passing through the points. It is led to the primary winding and passes through the primary winding to ground. The reason this wire is grounded is because one end of the armature wire is grounded and it is necessary for the current to return to place where it was generated. It was generated in the armature and therefore it must return to the armature. It does so by passing to the ground wire.

As the current is passing through the primary winding the breaker points are made to separate and immediately a high-voltage current is set up in the secondary coil. This high-voltage current is what is needed to produce a spark in the cylinder. The problem now is, how does the current get to the spark plugs? There is what is known as a distributor on the magneto. This is nothing more than a metal arm which is made to revolve on a shaft. This shaft is geared to the armature shaft. As this shaft revolves, it turns this piece of metal which is called the distributor arm. The distributor arm turns around and at the same time it touches four pieces of metal to which wires are attached. In Fig. 2 these four pieces of metal or segments are made black. The wire attached to these segments are attached at the other end to four spark plugs, one in each cylinder.

Now let us go back to the place where the high tension current was generated in the secondary winding. This current is led along a wire called the distributor wire which is attached to the distributor arm. As the arm revolves it gives up the current to the segment with which it happens to be in contact. As soon as the arm makes contact with the segment the current rushes to the segment, then to the wire and then to the spark plug. It does this to all four segments. After jumping across

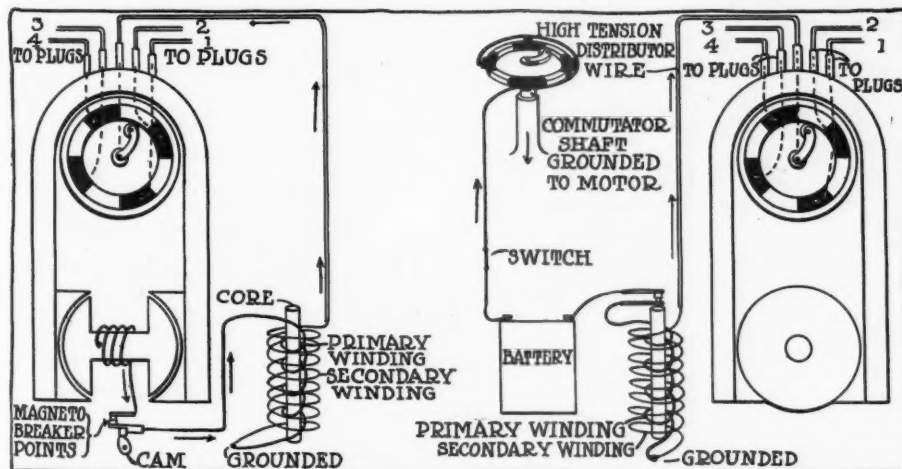


FIG. 2—TO THE LEFT IS SHOWN THE LOW-TENSION MAGNETO AND TO THE RIGHT THE BATTERY CIRCUIT OF THE DUAL SYSTEM

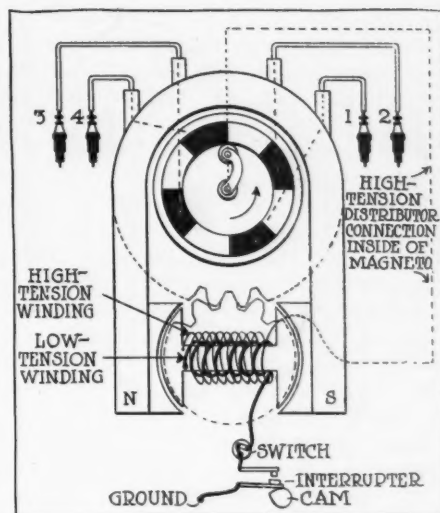


FIG. 3—THE HIGH-TENSION MAGNETO AND ITS WORKING PARTS

the gap in the spark plug the current immediately tries to get to the place where it was generated. This is the high-tension or secondary winding of the coil. The secondary winding of the high-tension coil is grounded and so is the end of the spark plug, because it is attached to the cylinder. The current then jumps the gap and returns through the different parts of the motor to the secondary winding where it was generated.

The foregoing is the operation of the low-tension magneto, but there is another type, as mentioned before, which is called the high-tension magneto. This type is shown in Fig. 3. Instead of having a coil on the outside, this magneto virtually has that coil within itself. In this type the armature is made up of two windings insulated from one another, instead of one as before. As the armature revolves a current is generated in the low-tension winding, but as soon as this current is broken by the breaker points, a high-tension current is induced in the secondary or high-tension winding of the armature. This high-tension current is led along the distributor wire to the distributor arm and thence to the segments. The segments are attached by a wire to the spark plugs, therefore the current gets to the plugs as soon as the arm makes contact with a segment. The rest of the action is the same as in the low-tension magneto.

2—Alternating current.

3—The breaker is used, as shown before to interrupt or break the primary circuit in order to get a high-tension current in the secondary winding.

4—There must be a breaker of some type somewhere in the primary circuit.

5—The set-spark requires no attention from the operator and hence his whole work of driving may be centered on the wheel and shifter levers. With this system one cannot make a mistake and crank the car with the spark advanced, for the spark is made to occur at the same place all the time. With the variable spark more

speed may be gotten from the motor by advancing the spark fully. With the set-spark the throttle position determines the speed, whereas in the variable spark the throttle may be set and the spark advanced, thus increasing motor speed.

6—In Fig. 2 at the right is shown the battery circuit of a dual system. It consists of a battery, a commutator or timer, and a coil. The circuit makes use also of the magneto distributor board. The commutator has as many segments as there are cylinders. The commutator usually is on a shaft. Running through the shaft is another shaft. As the camshaft revolves it turns the commutator shaft, which in turn revolves the arm. As the arm turns around it makes contact with the segments on the side of the timer.

When the switch on the dash is turned to battery the current flows from the battery to the commutator ring. Now, this ring connects all four segments. It does not matter upon what segment the arm is resting. The only reason the segments are used is to pass the current on to the coil at given intervals, so that it will be raised in voltage at the proper time. To make this more clear, if the segments on the timer are the same distance apart as the segments of the distributor and the arms revolve at the same speed, then when the timer is making contact the current will flow through the coil. After leaving the coil the distributor takes care of the cylinder to which the current is to go.

To continue with the path of the current: It leaves the battery and flows to the commutator ring, and then it takes the shortest path it can. If the arm is in contact with a certain segment the current will flow through that segment and then through the arm of the timer. It goes down the timer or commutator shaft and tries to get back to the place where it was generated. In doing so it meets the ground wire. But the primary coil is the shortest path it can take, so it goes then through the primary coil. The coil leads the current back to the battery.

But in passing through the primary winding of the coil, which is placed usually on the dash of the car, the core is magnetized. This draws down the breaker points, thus opening the circuit. As soon as the circuit is opened a high-tension current is set up in the secondary winding of the coil. This current is passed to the distributor as shown by arrows and then to the magneto distributor arm. The action following is the same as described in answer to the first question.

MAXWELL MODEL D CLUTCH SLIPS Too Much Coal Oil Will Dissolve the Necessary Oil on the Disks

St. John, Kan.—Editor Motor Age—I would like Motor Age to tell me how to stop a Maxwell model D clutch from slipping. I have used coal oil and changed oil several times and still it slips. Is there any adjustment that can be made or can new disks be used to fill up and make it tight?—Don I. Shepherd.

The clutch on the Maxwell D is of the

multiple-disk type and the plates are of steel. It is designed to run in oil and the application of coal oil tends to remove this oil. The slipping may be due to insufficient spring pressure and this spring pressure may be made greater by turning the adjusting collar to the right. This collar is located just behind the spring. Motor Age believes that the spring is not the cause of the slipping, but that the thrust bearings or washers are loose. Should the bearings or washers be loose, and in the former case the race slip around, the clutch will slip. As a suggestion, discontinue the application of coal oil and tighten the spring. If neither of these remedies the condition, the clutch

must be taken apart and the bearings examined. This should be done by an experienced man and Motor Age suggests that you permit the nearest Maxwell service station to do the work.

Inflation Pressure of Tire

Decatur, Ill.—Editor Motor Age—With an Overland roadster, model 69, equipped with 33 by 4-inch tires, weight 2,500 pounds, of which 1,100 pounds is on the two front and 1,400 pounds on the two rear wheels, tires embossed "inflate to 80 pounds," is not 80 pounds too much pressure to carry on front tires, each of which carries only 550 pounds? What is the correct pressure for the front tires? What is the correct pressure for the rear tires?—James K. Stafford.

The correct pressure for tires of a certain size varies with the make of tire. One maker will recommend 80 pounds pressure

Power of Two-Cylinder Engines Which

SEATTLE, Wash.—Editor Motor Age—Is there a difference between the power of a two-cylinder cyclecar engine with cylinders at an acute, say, 40 degrees, angle and one with cylinders opposed 180 degrees? What difference would there be in the powers of two such engines, the cylinders being 3 1/2-inch bore, 3 3/4-inch stroke?

2—Is the periodicity, or time between, the two power strokes variable in all two-cylinder engines with cylinders not opposed?

3—Where is the Automobilette cyclecar made and what is its selling price?

4—Where is the English G. N. built?—Cyclecar Observer.

The only power difference between the V twin and horizontal-opposed motors is based on the question of balance; but this is important enough to make the horizontal-opposed much more powerful than the V type on account of the high speed possible. This is proved by recent performances of the British A. B. C. motor at speeds around 4,200 revolutions per minute. A simple V-type motor probably would shake itself to pieces in a short time at such speed even if it could attain it. Thus your question of power is really a question of balance.

Fig. 4 shows the common type of V motor such as is used on a motorcycle, this being a narrow V at 40 to 50-degree angle. This narrow angle is demanded by

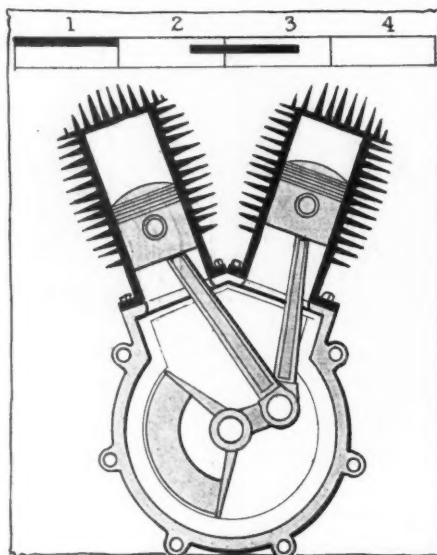


FIG. 4—THE CONVENTIONAL V TYPE OF MOTORCYCLE MOTOR WITH CYLINDERS SET AT 45 DEGREES

motorcycle-frame space limitations and makes a motor as hard to balance as a single-cylinder motor except that the power impulse is more frequent. It must be remembered that in balancing a motor there are two problems; the mechanical balance of moving parts and the balance of the explosion impulses. The former is the most important, but the latter must not be lost sight of, especially if high speed is sought.

In the type shown, the diagram above the motor shows the periods of firing by black lines, the open space in the four sections representing idle strokes.

The mechanical balance of the twin motor of this type may be much improved by setting the cylinders at a 90-degree angle as shown in Fig. 5. This demands a longer induction pipe and a special type of magneto, but is superior to the narrow V for cyclecar work on the point of balance. The firing, however, is more uneven than in the narrower V, as shown by the diagram above the sketch, the two impulses coming nearer together.

The best balanced motor of all—even better than the four-cylinder vertical—is the horizontal-opposed motor with cranks set at 180 degrees. In this motor shown in Fig. 6 all moving parts are exactly balanced. The pistons and cranks move in opposite directions

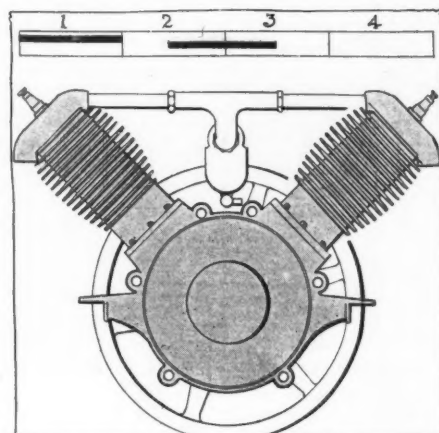


FIG. 5—THE 90-DEGREE TYPE WHICH HAS BETTER BALANCE THAN THE 45-DEGREE

for a tire of 4 inches in cross section, while another maker will recommend but 75. The construction of the tire is responsible for the inflation pressure at a given weight. Motor Age will tell you the exact inflation pressure necessary for a 33 by 4 inch tire if you mention the make of tire.

Cylinder Boring Advisable Sometimes

Lake City, Minn.—Editor Motor Age—Would Motor Age advise having an engine bored out?

2—If so, is it necessary to get new pistons, or just replace the old rings?—R. A. Hoyt.

If the cylinders are not badly scored or worn out of shape reboring is advisable, but where the reboring would require the removal of much metal it would not be wise to rebore. The wall of a cylinder is

made of a certain thickness, which is ample to withstand the strain under which it operates. Of course, a factor of safety is considered, but it is possible that by reboring, much metal will be taken away so as to make the walls weak. In a case of this kind it would be well to ask the maker of the motor what would be a safe amount of metal to remove.

2—If the cylinders are rebored only slightly, say .002 inch, the same pistons may be used and perhaps the same rings, but it has been found by experience that in instances of this character, if little is bored, new rings usually are required and in some cases new pistons. If you will mention the make of motor, Motor Age

Are Suitable for Installation in Cyclecars

at equal speeds, while the crank balances itself. The explosions are at even intervals also. This probably is the most efficient type of motor built, but has the disadvantage of length. This can be taken care of in a cyclecar very well, however, and by using this motor the designer will have the added advantage of low weight so necessary in a cyclecar of narrow tread.

The difference in power between the V twin and the horizontal of the bore and stroke you mention would be due to the higher number of revolutions per minute possible with the latter, this giving a gain of perhaps 5 per cent in horsepower at safe speed. The possible road speed of the car could be considerably more, however, as the weight would be lower.

If the horizontal motor were placed crosswise at the front of the car it might be water-cooled, the radiators being fitted on top of the cylinders direct. The fly-wheel being used as a blower in connection would make a compact, powerful and cheap

motor, with a little more power per cubic capacity than the air-cooled type.

3—The Automobilette is sold by Coignet & Ducrezel, 34 Tuaidu Point du Jour, Billancourt, Seine, France.

4—The G. N. is made by G. N. Higgs, 31 Vauxhall Bridge road, London S. W.

Driver in the Rear for Traction

Brooklyn, N. Y.—Editor Motor Age—What is the object of having the driver in the rear in some instances?

2—Who makes the Japanese motor used on the Morgan cyclecar?—Herman Bernard.

1—The very light cyclecar when used on the slippery surfaces of the foreign roads needs all the traction on the rear wheels possible, and hence the driver is arranged in this position to give the desired weight over the rear axle when the driver goes out alone. On the Dew car in the Grand Prix the passenger leaned far out to the rear to give extra weight on the wheels.

2—This is not a Japanese motor, though called the Jap, from the initials of the makers, the John A. Prestwich Co.

perhaps will tell you the allowable clearance between piston and cylinder, and then it can be determined whether new pistons will be required.

ONE CYLINDER MISSES ON BUICK

Loose Wire or Dirty Distributor Board May Be the Cause

Sapulpa, Okla.—Editor Motor Age—I have a 1913 Model 25 Buick and have considerable trouble with cylinder No. 2 missing fire and forming soot on the spark plug. I have tried several different plugs with the same result. The carburetor is in good shape and all the other cylinders and spark plugs work all right. Please advise me what to do.—R. L. Nelson.

If the spark plug gaps are not too wide it would be best to first inspect the wire to the missing cylinder. See that it makes perfect contact with the plug and with the magneto. Then inspect the distributor board of the magneto and see that there is no gummy deposit on segment No. 2. At the same time clean the distributor board with a little gasoline, then put a few drops of oil on the board. If the board is clean and the wire to the plug making perfect contact and the gap in the plug correct there is no reason for the cylinder misfiring. If these things are corrected and the missing continues, try carburetor adjustment by cutting down on the fuel supply. This means close the needle valve a little.

READER DISCUSSES TIRE PROBLEM

Finds Foreign Matter Imbedded in the Tread—Cut Filling

La Crosse, Wis.—Editor Motor Age—In answer to S. D. Hirsch's article on tires, I wish to say that I have found few valves that leak, but instead find that in cuts in tires there often are small particles of glass, stones, and even broken nails, which cause small leaks that are barely noticeable. Therefore, before I fill cuts, I probe in them and clean them thoroughly, then use a portable vulcanizer to fill them. The tires to which I am referring are on cars which I take care of, and which travel all the way from 1,000 to 2,000 miles a month over all kinds of roads and in all kinds of weather.

Another thing I do is to change them about, that is, put the right rear on the left front, and the left front to right rear, every 3,000 miles. In this way I change the wearing strain. I also have found that a tire gets the most strain on the outer side of the wheel. This I also have remedied by reversing the tires when I interchange them, and in this manner I get an average of 8,000 miles from one tire. I have at present on the car a tire that has run 7,600 miles, but did not fill the cuts in time and the consequence was sand got in the cut and worked the rubber loose from the fabric, so I put in an inner liner. I can get 1,000 miles more out of it without damaging the liner so that I cannot use it again. I have had a tire run 9,200 miles, but I presume that was out of the ordinary.—H. E. F. Schurz.

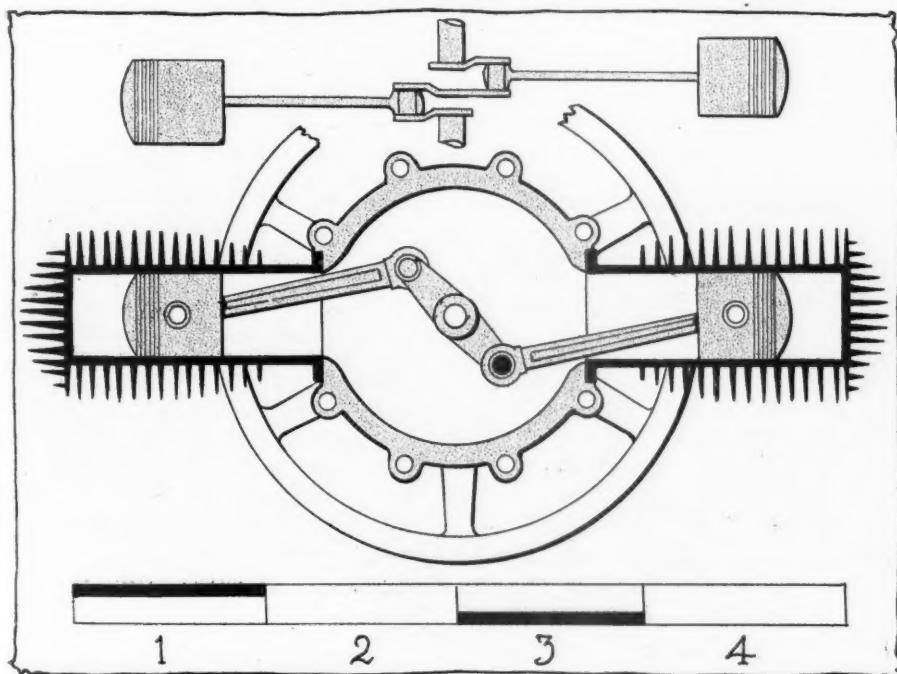


FIG. 6—HORIZONTAL OPPOSED TYPE OF MOTOR WHICH IS SAID TO HAVE BETTER BALANCE THAN A FOUR-CYLINDER VERTICAL MOTOR

Cowl Gasoline Tank and Left Drive on 1914 Hudson

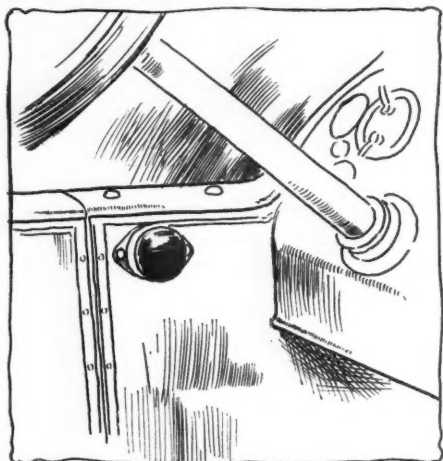
Four-Cylinder Model Discontinued by Detroit Concern

IN this age of specialization, the makers of motor cars are in accord with manufacturers of other lines of merchandise in seeking to concentrate upon the production of as few different models as consistent with the public demand. This makes for cheaper and better manufacturing, for it eliminates divided attention on the part of the workmen and tends to greater skill in turning out identically the same parts throughout the manufacturing season.

There have been for several years a number of prominent car makers who have adhered to the single chassis idea, and the trend for the coming year seems to be more and more in that direction.

Hudson's Single Chassis Model

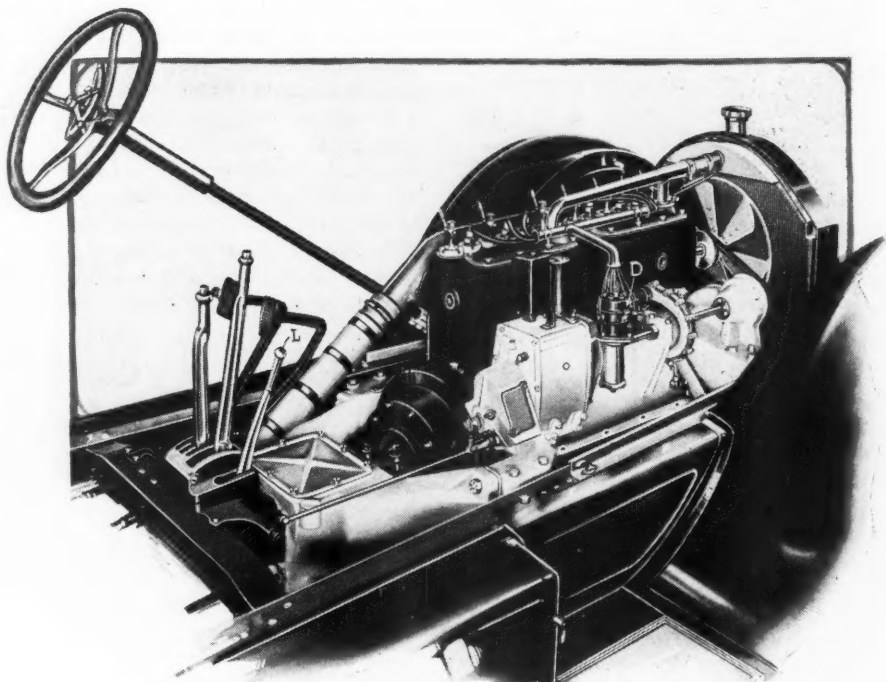
As a case in point, the Hudson Motor Car Co. has announced the manufacture of a single model of chassis for 1914. This really is a continuation of the model 54, the six-cylinder type which was introduced to the motoring public for the 1913 season, although here and there alterations of note



PUSH BUTTON FOR ELECTRIC HORN

have been made. The Hudson company, by this move, retires from the four-cylinder field entirely, having discontinued its model 37 four-cylinder type of last season.

The 1914 edition of the Hudson model 54 retains its L-head type motor with bore of $4\frac{1}{8}$ inches and stroke of $5\frac{1}{4}$ inches, and with the cylinders cast in blocks of three. This motor, which is of Continental make, is somewhat altered in the details of its design to make a lighter whole. The reciprocating parts in particular have been decreased in weight wherever practicable, making for less vibration and economic operation. According to the engineers at the Hudson factory, greater care than ever before has been given to the correct balance of all parts to within a small fraction of an ounce.



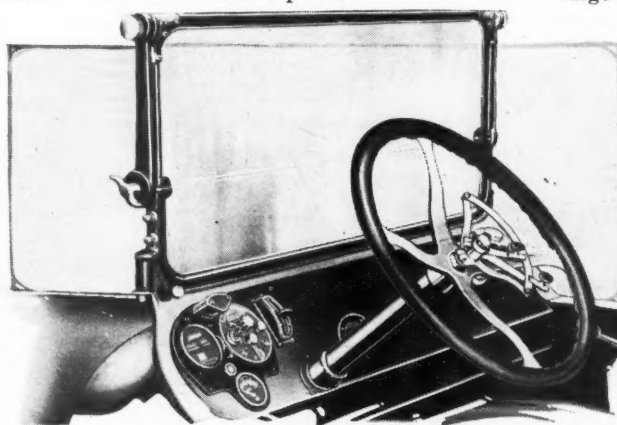
FRONT CHASSIS VIEW OF 1914 HUDSON SHOWING LEFT DRIVE

The lever L operates the switch for sending current from the battery to the starting motor. The Delco distributor D is now an integral part of the motor-generator unit

FEATURES OF THE 1914 HUDSON SIX

- Left drive and center control
- Four forward speeds
- Streamline body
- Cowl gasoline tank
- New type of Delco system
- Wheelbase now 135 inches
- Body hung lower than in 1913
- Speedometer gears protected
- Gravity fuel feed to be used
- Price reduced \$200

By making the crankshaft $\frac{1}{4}$ inch larger in diameter, its new measurement being $2\frac{1}{4}$ inches, greater rigidity is obtained and the use of the curved cheek on the shaft aids in giving it a better rotary balance, in that the center of gravity of the cheek is within the axle plane.



SOME HUDSON DETAILS

Position of the steering wheel and instruments. Note that the post runs through the cowl

The motor is suspended by integral crankcase arms at four points, as in 1913, while the gearcase bolts to the rear of the yoke which passes around the flywheel. The latter is not inclosed, and this, together with the yoke construction, are characteristic of Hudson design. In general, nothing unconventional is noticeable in the new 54 motor.

Uses 2-Inch Valves

The valves, all of which are inclosed on the left side, are of nickel steel and interchangeable. Their diameter is 2 inches, while they afford a clear opening of $\frac{1}{4}$ inch less. The design of the pushrod guide bushings has been altered somewhat so as to make their removal an easy matter. The crankshaft has three main bearings of large size and the camshaft possesses an equal number. Nickel babbitt backed with bronze is used in the construction of all of these mountings. The timing gears at the forward end of the power plant are of helical shape and well inclosed in the usual way against foreign matter.

The exhaust manifold, located above the intake, provides an individual passage from each cylinder, which allows free escape of the burned gases. The intake has one connection to each of the blocks of three cylinders, which is also true of the water connections.

On the valve side the Zenith

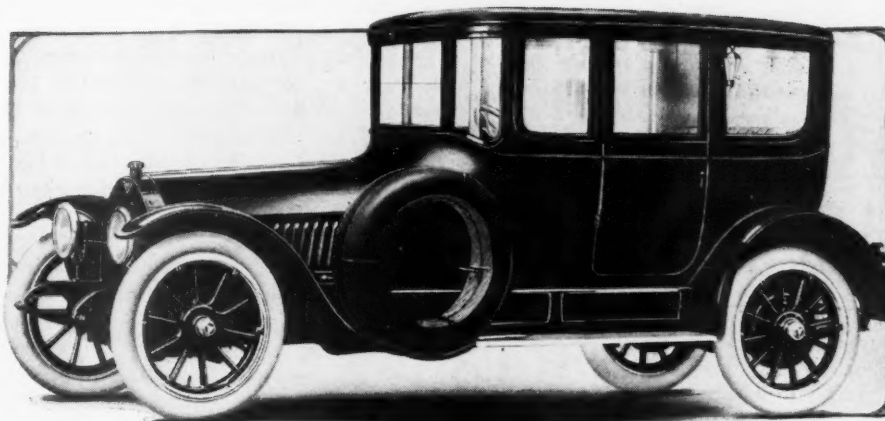
carburetor also is located. This make of instrument is continued from last year, and is of improved type providing adjustment for low speed. There is a control valve attached to the carburetor to regulate the hot and cold air, and also a strangler.

Improved Delco System Used

On the right side is the pump shaft, which in addition to operating the centrifugal water pump, drives the Delco motor-generator and timer. The combination Delco ignition, cranking and lighting system which was made a feature of Hudson cars last year is continued with some changes. The ignition distributor for timing the sparking in the cylinders is now made an integral part of the motor-generator unit, whereas on the 1913 models it was placed at the forward end of the engine and separate from the electrical unit which must necessarily be located at the rear so that its driving gearing may be made to mesh with the teeth cut in the periphery of the flywheel for cranking the engine.

In its adaptation to the Hudson power plant, the Delco system is specially built as an integral part. The entire system is controlled by a special switch within reach of the driver of the car. The system provides a dual ignition arrangement with a single set of plugs, the generator giving a magneto type of spark for ordinary running, while an auxiliary set of dry cells provides for emergencies.

For cranking the engine, the generator is temporarily converted into an electric motor and turns the crankshaft through the intermediary of the flywheel and gearing which is thrown in by the operator. However, the electrical cranking method is understood by the average motorist of today, and it is needless to go into details here. In the Hudson method of starting on these new sixes, however, there is one point of difference from the 1913 models, in that a lever located on the right side of the gearshift lever in the center of the car operates the switch for sending current



A DISTINCTIVE BODY TYPE

An Inclosed Hudson showing the graceful head and cowl and the method of carrying the spare tires. Note the single entrance door

from the storage battery to the electric motor and throws in the gears to the flywheel. Heretofore a pedal has been provided for the performing of these functions.

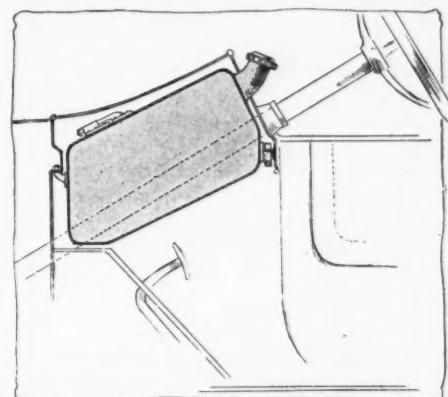
The various motor improvements have resulted in a considerable increase in the mileage per gallon of gasoline. The connecting rods have been considerably lightened and the weight of the pistons also reduced. Further fuel economy is gained by the carburetor setting, which is such that it gives the best results for road speed rather than express acceleration. There is a growing feeling among the industry that a rational acceleration is desirable to that quick get-away of the racing car, which is so hard on tires as well as the car mechanism in general.

No Side Lights on New Hudson

On the new Hudson, side lights are eliminated entirely, the 12-inch headlights, rear light and dash lamp being all that are necessary since a special dimming attachment is provided for regulating the power of the headlights. For city driving these may be made dim so as not to blind other traffic. All lights are regulated by a single

switch handle, different positions of this determining the combinations of lights.

Continuing back of the motor, it is noted that the plate clutch is continued. It is self-contained in an oil-tight case which is a part of the flywheel. The disks are 11 inches in diameter, are steel stampings and the driven ones are provided with cork inserts to prevent grabbing. The clutch



HUDSON COWL GASOLINE TANK

The steering post runs through the cowl as shown by the dotted lines

spring is located in a hole bored in the end of the crankshaft, while the pressure is transmitted to the clutch drum through a ball-thrust bearing. Small springs are placed between the disks to facilitate disengagement when the clutch is thrown out. The whole runs in a half-and-half mixture of oil and kerosene.

Four-Speed Gearset Adopted

The new Hudson is provided with a four-speed gearset, whereas the three-speed type formerly was used. This new gearset is similar in construction to its predecessor, the direct drive being on third speed, while fourth is geared up considerably. Roller bearings are used throughout these gears, the bearings being mounted in malleable iron cages to insure against working loose and in order to provide for expeditious removal. On direct drive the gear ratio between the crankshaft and rear wheels is 3.66 to 1, and on the indirect fourth speed 2.99 to 1.



SIX-CYLINDER SEVEN-PASSENGER 1914 HUDSON

This touring car is seen this year with a number of detail improvements. The extra tires are carried ahead of the front door on the left side of the car

The propeller shaft is uninclosed and is provided with two universals. A triangular torsion rod runs alongside of this shaft back to the axle housing. At its forward end this rod is carried in a spring buffer, mounted in a rocking bracket and attached to the cross member of the frame.

Floating Rear Axle

The rear axle is of the floating type, the load being carried on the housings and not by the shafts. Roller bearings are conspicuous throughout the rear system, which in every respect is in accord with modern design. The differential and pinion are mounted in a separate carrier and can be removed separately from the rest of the axle; suitable adjustment features are provided; axle driving shafts have integral flanges which bolt to the rear wheels.

A new feature in conjunction with Hudson rear axles is that of mounting the three-fourths elliptic springs beneath the axle, a construction which gives a wider-open spring, which gives a greater range of spring movement without the frame striking upon the axle.

A special feature of the front axle construction is the placing of the speedometer gears within the left wheel spindle in an integral housing. The gears are of helical cut and run in grease. This construction eliminates the noise of these gears and at the same time protects them against road dirt. The accuracy of the speed-indicating instrument should be augmented by this arrangement.

The front axle has a slightly rearward tilt, throwing the spindle pin backward, and to further increase the steering qualities of the car and reduce tire wear to a minimum, the spindle pin inclines inward at the top so that if continued to the ground it would intersect the tire at the point of road contact, the value of such a design being that in turning to right or left the tire turns on a single point, which gives the minimum of wear, instead of on a short lever arm on the tire tread, which is the case where the downward continuation of the spindle pin does not intersect the point of contact of the tire with the road.

The frame side members are straight from end to end except for the upsweep in advance of the rear axle, the dash offset, or narrowing of 1913 being discontinued. To partly reach the same result as the offset at the dash, namely, bringing the side members closer together alongside the motor, so as to give a good motor support has been accomplished by having them gradually converge from the rear to the radiator, a design which permits of more ready fitting of power plant attachments than possible, with the dash offset. With this converging design it is possible to have the side members well separated at the rear, so wide as to mount the springs directly beneath the frame pieces, instead of outside of them.

It is interesting to note that on this new car the Hudson company has shifted

its gasoline tank from the rear of the chassis under the frame to a position under the cowl in front. Due to this change, the fuel is now fed to the carburetor by gravity, whereas a pressure feed system formerly was necessitated. This location utilizes heretofore wasted space and at the same time insures positive feed to the carburetor as long as there is any fuel in the tank.

The tank carries 21 gallons and there are two partitions to prevent the liquid from splashing sidewise. A gauge on the dash shows the amount of fuel contained, while a sediment cup under the tank catches all foreign matter which otherwise would find its way to the carburetor. On this sediment cup a shut-off cock to the carburetor is also attached.

Left Steer and Center Control

The new Hudson also appears with the steering changed to the left side, while control levers now are located on the center. Right drive and control were used on the 1913 six. The steering column passes through the cowl board, which is another feature new to Hudson construction, in that formerly the rod has passed upward free of any part of the body. Spark and throttle levers on the top of the wheel are fitted with friction plungers for holding them in position on the quadrant instead of ratchets.

The chassis has been improved generally by the addition of larger grease cups and fitting more of them. This is one of the important improvements noticeable on many of the 1914 chassis, and it is one which will meet with approval by every car owner. The periodic turning down of grease cups seems a small matter, but it is most conducive to improved running of the car. Considerable weight has been eliminated by discontinuing the sod pan, its place being taken by fish plates, which fill the gap between the crankcase and the frame members, and further, by a small apron beneath the flywheel. Leaving off the sod pan beneath the crankcase permits of the cool air striking the base of the case and aiding in keeping the oil cool.

Considerable change is evident in the body designs. The stream-line, flush-sided effect is very pronounced. The cowl is considerably rounded and slopes to the hood,

which in turn slopes downward to the radiator. Fenders are crowned somewhat and follow the lines of the wheels more than ever. Running boards are practically clear in keeping with the smooth appearance of the whole. The rear of the body is rounded and curves inward at the bottom. Provision for the carrying of the tires is made at the forward end of the left running board.

Yet this general lengthening out of the appearance of the car is not due to the shape of the body alone, for the wheelbase actually has been increased by 8 inches, that is, from 127 to 135 inches. The standard body colors are a coach blue for the body proper and black moldings cut with a hair-line gold stripe. Running gear is done in black.

A feature which does its part in giving a clean-cut side appearance is that of locating the battery, together with the voltage regulator and cut-out of the Delco system, and also the dry cells for ignition starting between the running board and the frame on the right side beneath the front door. In this position they are most acceptable and due to the cover for them being continuous with the apron between the frame and the running board their presence ordinarily passes unnoticed. In this position they have the further advantage of balancing the weight of the spare rims with tires which are carried in advance of the front door on the left side.

Equipment Details

The equipment is most complete and includes a motor-driven electric horn, Jiffy curtains and pantasote top, license carriers, folding trunk rack attached at the rear, integral windshield, speedometer sunk in the dash apron, demountable rims with one extra rim, permanently attached extra folding seats in the tonneau for converting the car from a five to a seven-passenger type.

The price of the new 54 has been decreased somewhat, it being now offered for \$2,250, as against a figure \$200 higher for last season.

BROC FOOT CONTROL

There is a demand on forward-drive electrics for wheel-steer with foot-speed control in place of wheel or lever-steer with hand-control, as it is desirable the operator have both hands free for steering.

Broc electrics offer an option of foot-control which is manipulated from neutral or power-off position by tilting the pedal forward to the speed desired. When the desired speed is obtained no pressure on the pedal is required to retain same. The foot may be removed from the pedal. As the reverse is only manipulated when car is at a standstill, the reverse lever is located in center of wheel, various reversing speeds are secured the same as forward speeds by means of foot pedal. To obtain neutral or power-off position, the pedal is tilted to the rear—a further movement in that direction applies the shaft brake. Rear wheel locking brakes also are furnished. It is illustrated on this page.



BROC FOOT SPEED CONTROL AND WHEEL STEER

Wahl Car Selling for \$790 Has V-Shaped Radiator

THE Wahl Motor Co., of Detroit, is offering to the public a new car in two designs—a two-passenger roadster and a five-passenger touring car. The power plant follows the very general practice of placing the motor, clutch and transmission in a unit. The four cylinders are cast in pairs and have a bore of 3.25 inches. A stroke of 5.5 inches gives the motor an honest claim to belonging to the long-stroke class, since the stroke-bore ratio is 1.692.

The maker does not quote a horsepower rating because it claims that these ratings have been so often mistated that they have lost their value. Applying the S. A. E. formula, which is being used in a number of states as a basis of taxation, it comes to 16.92 horsepower. Considering the piston displacement of 182.5 cubic inches in the light of recent investigations of long-stroke motors it is safe to assume that this engine will develop about 19 horsepower at 1,000 feet per minute piston travel, and about 24 horsepower at 1,400 revolutions per minute.

The three-bearing crankshaft and other moving motor parts are lubricated by a splash system in which the oil level is kept constant by a pump.

The clutch is of the multiple-disk type with plates 9 inches in diameter and covered with raybestos. The driver's left foot operates the lever for disengaging the clutch and the service brake pedal is to the right. The gears for the three speeds forward and the reverse are shifted by a cane-handled lever in the center of the car. Next to this lever is a second one for applying the emergency brakes. This center control with the steering gear placed on the right-hand side, gives very easy access to the driver's seat from either side of the car. The throttle lever is placed above the 17-inch steering wheel and is interconnected with an accelerator placed between the other two pedals. A dash lever for controlling the air valve on the model H Holley carbureter completes the control elements, since, for the sake of simplicity of operation, the Bosch high-tension magneto is given a fixed timing.

Thermo-syphon circulation sends the cooling water through a V-shaped radiator. The radiator, and all the other bright metal parts on the car, are nickel-plated. It will be noted from the illustrations that the 108-inch wheelbase allows for a body of sufficient length to give plenty of leg room in both compartments, and further, that all the doors are full size and do not have the corners cut off in order to clear the fenders. A double drop is made in the frame to allow for easy entrance to the body and to keep the center of gravity low when the car is loaded. The side rails of the frame are also swept in at the front in order to give a small turning radius.

Hyatt bearings are incorporated in a



FIVE-PASSENGER WAHL CAR WITH ODD RADIATOR

Salisbury semi-floating rear axle. Both the service and emergency brakes act on 12-inch drums. Between the frame and axles are semi-elliptic springs in the front, and elliptic springs in the rear. To the 32-inch wood artillery wheels are fitted 3½-inch tires on quick-detachable rims.

The standard equipment on this car includes a mohair top, top envelope, Prestolite tank, gas headlights, oil side and tail lamps, a speedometer, and a windshield of special design. Besides these there are the horn, repair kits and other necessities, for the care and operation of the car.

Ford's Prices for 1914 Show Reduction

TAKING effect on August 1, the following reductions have been made in the prices of Ford cars. In the United States the model T runabout was reduced from \$525 to \$500; the model T touring car from \$600 to \$500 and the model T town car from \$800 to \$750. In the dominion of Canada the prices also were cut from \$675 to \$600 for the runabout, \$750 to \$650 for the touring car and \$1,000 to \$900 for the town car. These prices will be final for the 1914 season.

The announcement of the reductions is in line with the policy that Henry Ford has held since he entered the motor car industry. It has been his idea to offer the cars at the lowest figure that was consistent with his ideals of quality, and therefore to reduce the selling price as often as increased production would make it possible. Mr. Ford says that these reductions will continue and that when the yearly output reaches the half-million mark that the prices will be considerably lower than they are now.

MAINE AFTER MOTOR SMUGGLERS

Boston, Mass., Aug. 2—Motor trucks as carriers of liquor from states that allow license into dry states has been put under the ban by the federal and state governments in this vicinity as a result of the new law that went into effect recently. The first to feel the heavy hand of the officials were three Boston men, Frank

J. Glaser, Francis R. Downey and George King. Up to date they have been arrested four times.

They were driving through Wales, Me., with 3½ tons of whiskey, carefully covered and bound from Boston for Augusta, when the big truck broke through a bridge. While aid was being summoned curious natives became suspicious. A deputy sheriff was summoned and investigated the truck load. He seized the vehicle and hailed Glaser and Downey, who were handling the truck to court, where they were fined. King appeared on the scene and he, too, was arrested.

The Cumberland county officers then grabbed the trio and there was another trip before a court with additional fines, the state law allowing an arrest in each stepped in and took the trio into custody at Portland for breaking the federal law. They were held there on a continuance and released on bail.

Just as they stepped out of the clutches of the federal officers, York county officers gripped them and haled them to Waterville, they having proceeded through that county.

The Maine officers believe that much liquor has been transported into Maine by motor cars, and because of the fact that no accidents have occurred it has been delivered safely. The federal law now provides a penalty both for sending the liquor to a no-license state and for not marking it plainly.

Illustrated Hints on Body Kinks for Use on Commercial Motor Vehicles

EVERY business man planning to use motor trucks is on the lookout for new body ideas, especially those that have been tried out. In one line of work a certain type of body or a certain dimension of box may be demanded and yet have certain disadvantages which some other in the same line may have overcome. Any new body idea in any line offers possibilities. The following are examples of ideas actually in use and all having good points which lead to better service.

Fig. 1 shows an idea in use by the south park board of Chicago on a 1-ton motor truck used for electrical repair work about the boulevard systems. The truck itself is a standard type, but has a repair tower fixed over the seat in front of the box body which is unique, as it forms a cab for the driver and helper as well as a tower platform for work. At the same time, the machine has an especially fine appearance, as the tower looks like it was part of the body.

Construction of Tower

The tower is formed of four steel angle-irons, two at the edges of the dash and the other two at the outer edges of the seat back. These four form a steel-framed square which supports the platform above at about the ordinary height of the roof of a limousine. The platform is made in the form of a steel-sided box about 16 inches deep and could be arranged very easily to raise and lower if this were necessary in the service. The whole car is finished in olive green, is mounted on pneumatic tires, and is as pleasant to the eye on the boulevard where it operates—a thoroughfare forbidden to ordinary motor trucks—as the finest finished touring car.

Another idea worth describing is the rear tool drawer fitted on one of the other trucks operating for the same board. This drawer—as shown in Fig. 2—is constructed to slide between the frame member channels under the body and is almost as long as the car body. The drawer is shallow but wide, and contains tools and small supplies. When on the road or standing this drawer is kept locked, so there is no reason for the loss of tools by theft. When repair work is going on the drawer can be pulled out to allow access to every tool in the equipment without searching under a stack or in a deep box for each item, this saving time.

The Chicago Telephone Co. has in use a truck which makes very little mileage per day and yet pays a good dividend.

To accomplish the object of quick handling the car is loaded by crate. This is to eliminate the idle loading time which has formerly been so responsible for truck failures. By the crate method the load, all routed and ready for delivery, is put on in

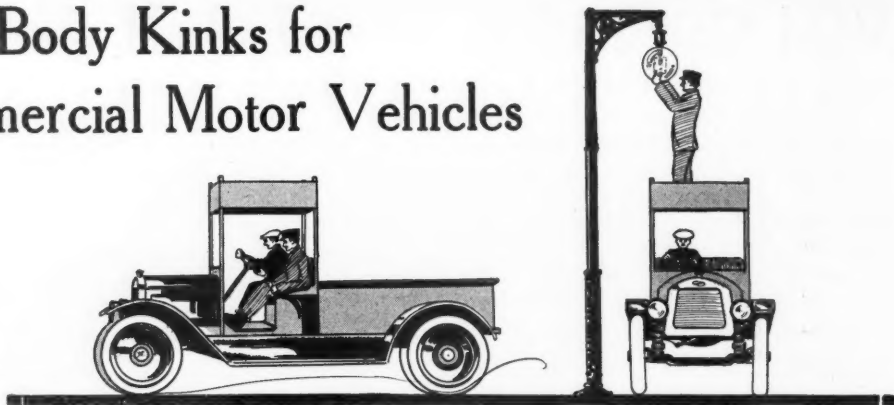


Fig. 1—An especially neat appearing tower wagon in use by the South Park board, Chicago, on the boulevard systems

By William B. Stout

5 minutes. Formerly loading took 1 hour. The crate itself contains the secret of quick delivery on the road, the arrangement and construction being patented by Mr. Tedford, manager of The Hub.

This crate is subdivided by a partition, or shelf, halfway up its height. This shelf has two rails on it, as has also the floor below. On these rails slide smaller crates half as big as the compartments, or, in other words, taking up one-fourth of the crate space. These are shown at 1 and 3 in Fig. 6.

In loading the car the boxes, which are of more or less uniform size, are loaded in all compartments, the roller trucks at the

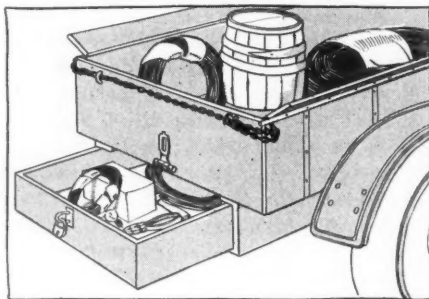


Fig. 2—Another South Park truck idea, a long shallow drawer being fitted beneath the truck body to hold tools out of the way of theft and handy for use

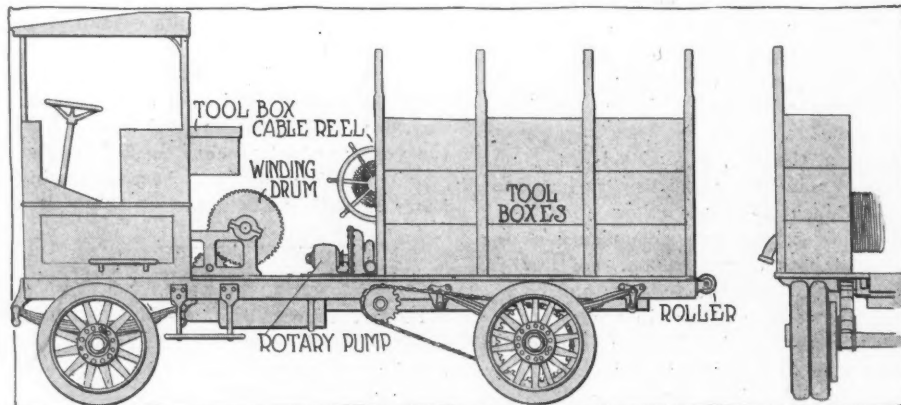


Fig. 3—A motor truck used by the Chicago Telephone Co. This machine stands idle most of the time so far as road work is concerned but pays by working at the job while standing still. It is fitted with a winch and cable for conduit work and drawing cable, and a rotary pump for clearing manholes of water

back. The bundles are sorted so that the two top compartments contain the out-trip bundles. The first deliveries are from the upper compartment just back of the seat, or the compartment—2—in the drawings. The drawing 2 shows how the truck looks when the first compartment is empty. The driver or helper then reaches back, releases a catch and rolls the truck—1—forward, where the catch drops again to hold it so it cannot roll. The driver then proceeds with delivery as before, taking the bundles from right in back, in easy reach. There is no stretching for bundles.

Operation of Crate System

When this is empty it is rolled back to its first position again. The next compartment is the lower front one, and this is reached either through the opening back of the seat or, with short cars, through opening the floor of 2 as a door. This is shown at D. When the compartment 4 is empty, then 3 is wheeled forward and emptied in turn.

In this way the driver has his load all sorted from the shipping room and has no wait to route in the wagon, every bundle can be reached from the seat and is in order and in plain sight. No lantern is needed for night work.

After the truck crate is empty it can be rolled off the truck—as the whole crate is on rollers—and back to the shipping room for reloading, while a full crate all

ready can be immediately loaded. The idea is exceptionally good for package work where the bundles are of fairly even size. This machine utilizes the motor for other work when the machine itself is idle. The general layout of the machine is shown in Figs. 3 and 4.

The truck is of the motor-under-the-seat type and has no particular chassis differences from standard types. The difference in construction is all back of the driver's seat, the first item being a tool box overhanging just at the rear of this seat.

Directly under this box is a winding drum, driven from the motor shaft and equipped with a long steel cable. This is for heavy work, which can be handled over the rear end of the machine. The counter-shaft of this drum sticks out to one side and ends in a winch-drum for lighter hauling work. Just back of this is a wooden reel for stout hemp rope.

Power-Driven Pump Used

Across from this reel on the opposite side of the car is a power-driven centrifugal pump, driven of course from the truck motor. From these points back, at the sides of the body, are stacked long narrow tool boxes, containing tool and supply equipment for gangs of workmen engaged in the telephone construction work.

The centrifugal pump is used when the machine arrives at the scene of work, a hose being connected to pump the water out of manholes. After this is done the work proceeds.

How cable is drawn through conduits by the machine is shown in Fig. 5. The truck carries as a part of its equipment a couple of wooden pieces of great strength, with a space between where grooved pulleys can be supported on axle cross-pieces at varying points. This equipment is put into the manhole, as shown, and the pulleys fitted between, one at the top opposite the side winding drum, and one below with its bot-

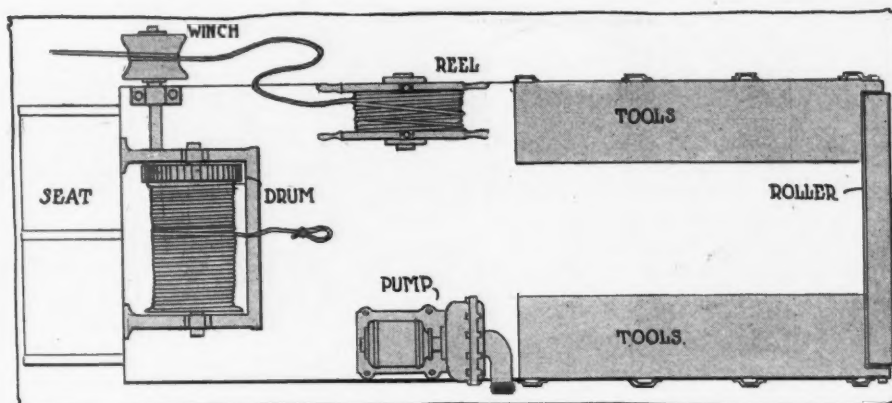


Fig. 4—Plan of Chicago Telephone truck showing the location of features. The tool boxes at the side are removable when the truck is used for hauling. The drum is used for heavy work, the winch for hauling cable

tom face opposite the hole through which the rope will pull. The rope from the drum runs over the top pulley and under the bottom one, as shown, the pull of the rope keeping the plank device in position. This arrangement allows of quick action, small delays for an expensive crew, and is a great saving in telephone construction and repair work. This body is meant for heavy work and big accomplishment. The opposite is the idea of a package delivery body in use by The Hub, Chicago, Fig. 6.

The idea of this construction is to eliminate every possible idle second of the car on the road, mainly by having every package right at hand when the driver wants it, without any searching and with no reaching. The firm figures that 1 minute per stop is saved by this device, and the firm's ten cars are making as high as 200 stops on Saturdays, with 160 average per day.

Body for the Baker

A body for somewhat similar service, but a different class of load, is that shown in Fig. 7, as used by the Piper Bread Co., of Chicago, for city and suburban delivery of

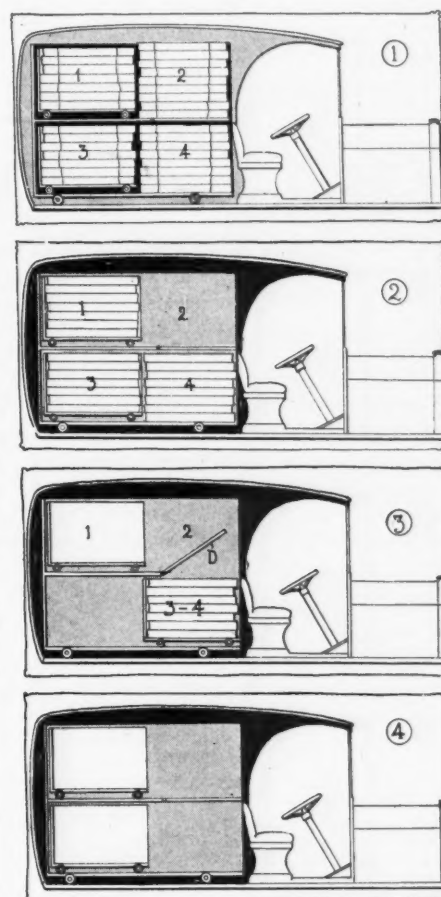


Fig. 6—Package body used by the Hub, Chicago, so made that the packages are always at the driver's hand, and routed in order. The whole load is put on in the crate. This is in four compartments which are unloaded one at a time, the rear ones rolling forward as the front ones empty

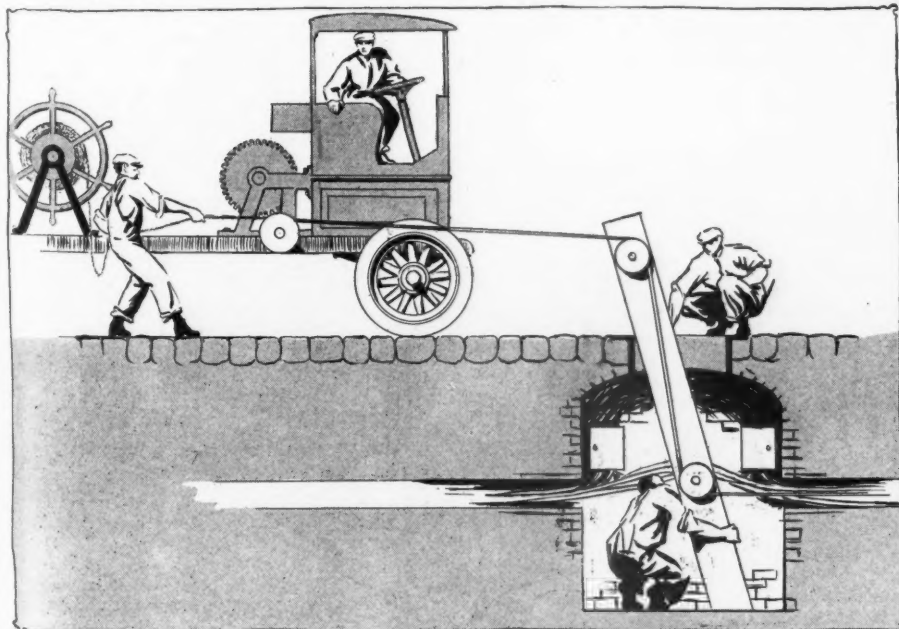


Fig. 5—How the winch is used in drawing cable through or out of conduits, the rope being taken to the reel on the left

bakery products and more especially bread to grocery and restaurant customers. The chief idea in this construction is to allow the driver to get off the rig quickly with his load, which must be carried in bulk, enclosed, and clean.

The driver sits on the left-hand side of the car, with an alley to his right leading back to the center of the car body, while just back of him is a three-shelved cupboard reaching to the roof of the car and with doors facing back. At the extreme

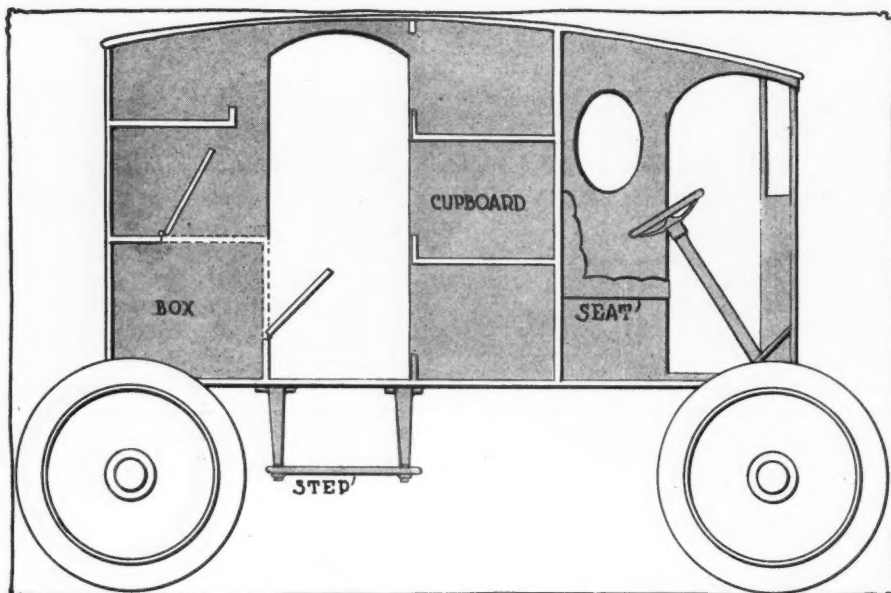


Fig. 7—Body used by Piper Bread Co., of Chicago. Side view showing cupboards, and relation of seat

Influence of the Driver on Truck Life

rear end of the body, on the floor, is a box about 2 feet square, and as long as the car is wide inside, having hinged covers on top and in front, as shown, for further bread load. Above this is a wide shelf for extras, etc.

Between the three shelves, the box and the shelf, there is room for a good-sized load, and all of it is handy, though one cannot but think that the arrangement wastes a lot of space which is being carried around by power at so much per mile. If all the load could be reached from the seat the alley and standing space could be eliminated.

From the standing space access and egress is had through sliding doors at the side as shown, having a wide step just below. This feature is very good. The trucks on which this is used make about 35 miles a day, with sixty-five stops, running from 4:30 a. m. to 2 p. m. The car is an electric and not fast enough for the work.

Absolutely different is the body scheme used by a Chicago oil company, shown in Fig. 8. In this case the attempt is to deliver from big removable units so that returning empties can be replaced by full containers and do away with idle loading time.

In this case the oil tanks, two in number, are supported on 6-by-6-inch skids connected by cross braces of heavy iron pipe. The tanks are protected by these skids from undue strains and by their means the heavy loads can be slid off and on to the standard box body truck with ease. The scheme saves loading time and has been used successfully for 5 months.

The choice of a truck body, whether for small or heavy work, is important and a study of what has been and is being done in special bodies is a big help in planning future body designs.

THE importance of the driver in successful motor truck operation is shown by the experiences of two teaming companies of Chicago, each firm running the same kind of trucks in much the same service, but under different driver systems and obtaining different results.

The first firm runs two 4-ton trucks and has hired chauffeurs to take care of and run the cars. These are men who are supposed to know machinery and to handle it accordingly.

The second firm has taken teamsters from wagons and has promoted them to the position of motor truck drivers after a short period of study during the time the motor truck was demonstrated by the selling firm. These men know the city routes and customers, and the conditions of traffic and delivery, but little of machinery or mechanism. They do with the trucks merely as they are told.

The first firm with the hired chauffeurs has had continual trouble. The machines have been overspeeded and the repair bills made double what they should be. On four occasions they have had accidents due in nearly every case to carelessness. On one occasion when racing with a street car one of the drivers turned suddenly so that the back of the truck hit the street car and was badly smashed, though the driver continued on his way without stopping—a basis of further trouble with the street car company.

These machines are good trucks, but the firm using them is very much dissatisfied and will not discuss motor haulage without warming under the collar. "Trucks are no good. They cost more than horses. They are in the repair shop all the time. They won't do," it says.

The other firm has had no trouble with its machines of the same make in the same work, over the same streets and in the same climatic conditions. The drivers run slowly, being forbidden to speed, especially when empty. The governor on these cars is set at 12 miles per hour. These men are not used to driving cars and do not know the call of speed as does the graduate touring-car driver, hence they are satisfied with the speed they get. When they stop and start they take greater care, and as a result the truck has made good. The one accident so far was not the driver's fault.

This is but one case, but for local Chicago conditions the greater part of the firms adopting motor trucks are graduating teamsters, rather than hiring professional mechanical men. That the motor trucks can be so well run by green men, in a mechanical sense, is only another proof of how far the motor vehicle has progressed.

TRUCK FOR GASOLINE AND OIL

A rather novel tank wagon is used by the Mills Oil Co., Syracuse, N. Y., for the delivery of gasoline and oils. The tank is divided into two compartments, each holding 140 gallons, and with its pillow blocks is removably mounted upon the

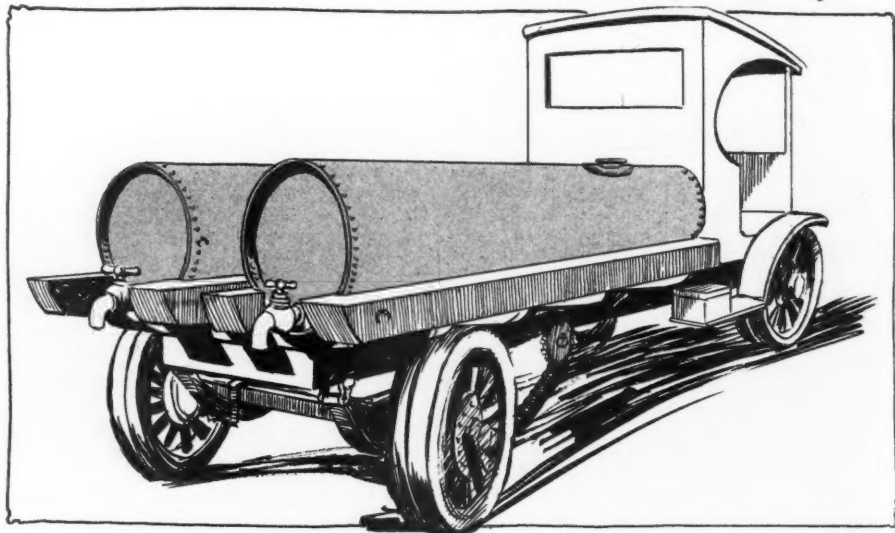


Fig. 8—Double oil tank body used by a Chicago oil concern. The units are on skids and removable for replacement with filled tanks

flat deck of a Palmer-Moore truck. The removal of the tank therefore is quite a simple matter, and for the delivery of cans and barrels, the truck may be used with the flat deck and stakes slipped into sockets provided for that purpose.

The two cans at the rear of the tank hold 5 gallons each and the Mills Oil Co. places a 10-gallon can up in front with the driver. As the tank holds 280 gallons this gives the wagon a total capacity of 300 gallons.

BIG PHILADELPHIA PARADE

Six hundred and twenty-seven commercial vehicles, making a procession nearly 2 miles long, participated in the motor truck parade and industrial exhibit conducted by the Philadelphia Inquirer and the Philadelphia Automobile Trade Association, July 31, making a record for events of its kind. Incidentally, the event gave a convincing demonstration of the growth of the motor truck in delivery service of all kinds of businesses.

Included in line were light delivery wagons used principally for transporting small packages, up to giants with a capacity of 15,000 pounds, the majority of which were loaded just as they are day after day in the performance of their duty, making a striking argument for the superiority of the truck as they wound their way slowly throughout the principal business thoroughfares of the city, thence northward on Broad street to the Northeast boulevard, where about half dropped out to go back to duty, while the others proceeded to Schuetzen park, where luncheon was served and the cars parked for the afternoon.

The cars were divided into sections, according to carrying capacity, and formed in streets adjacent to the city hall, swinging into line on Market street and proceeding east on that thoroughfare to the Delaware river. Each division was preceded by a band and cars carried a pennant to designate its section, each section boasting a different color.

Mammoth trucks of over 7,000 pounds carrying capacity led the parade. This division was a very imposing one, containing about seventy-five cars capable of carrying huge burdens, and as if to confute the general opinion that they were too cumbersome, let out a link at various points to demonstrate their ground covering ability.

The most interesting feature of the day, however, came after the parade was over, when about 300 of the vehicles were lined up for close inspection in Schuetzen park. The arrangement of the cars in the park had been previously determined upon, with the result that there was no confusion and in a very short time after their arrival the vehicles were in their allotted spaces. Schuetzen park itself was quickly filled and the overflow was accommodated on the adjoining grounds of the Philadelphia & Reading Railway Athletic Association.

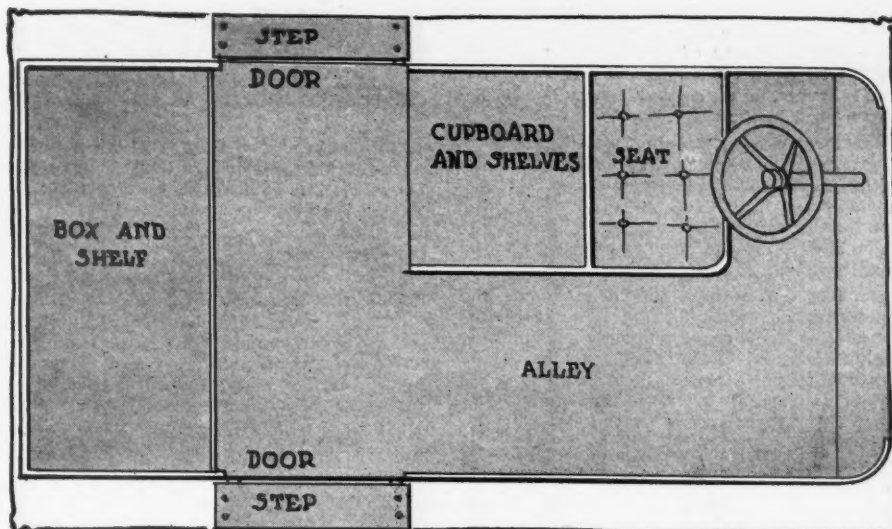


Fig. 9—Top view of Piper Bread Co. truck body showing alley from driver's seat, and location of cupboards and shelves

Buyers' Feeling Toward Salesmen

WHILE salesmen are interested in selling motor trucks they must be interested in knowing the attitude of the big buyer toward their profession. Just what this is, in one case is shown by a recent interview with the purchasing agent for one of the largest engineering concerns in the middle west.

"I am tremendously interested in the motor truck and in its progress, and we are having fine success with the ones we have, but I would rather buy anything else rather than motor trucks. There are so few salesmen who come in here who know what they are doing. I have had any number come in and try to sell me a truck which was a good truck, but which they knew, as well as I did, was not fitted to our work. They were willing to sell to me, however, if I would buy. If I had been fool enough to buy and taken the machine, and later found it would not make good in my work, through expensive experience I would have no more use for their firm, and they know it; yet, for the money of today, they are willing to sell at the expense of tomorrow."

We went through so much of this that finally we put our own engineers to work on the job. They plotted the whole system, studied and figured, and finally found by mathematics just what we wanted. Then we called the salesmen in and told them the result, and looked over their propositions. They saw, all of them, that we had the results and knew what we needed, yet even then two of them wanted to put in the other proposition on the plea that they had had many years of experience with trucks and hence must know more about it than we.

We put in trucks that come to our specifications and I will say that they are doing their work just about as we figured, and we are well satisfied. I am strong for motor trucks and for the boys in the busi-

ness, but they must learn more about their machines. They can give out their sales talk about the kind of steel in the rear axle or the bore and stroke of the motor, but they rarely have the dope we want. If I am studying to put in trucks, I don't study the truck, but the shipping room. When I know the shipping conditions and delivery conditions, I know what kind of a truck I want. The mechanism I am willing to leave to the makers, for the most part, but the body and size and general type of truck I want I tell from my business.

The buyer doesn't care how quickly a truck wears out, so it pays a dividend. I don't care a bit if I wear out a truck a year, so long as I can see where the machine will pay for itself that year. Whether it will or not is a business proposition, much more than a mechanical one, so it is a question of dividends primarily.

When the salesmen realize this and work to sell for tomorrow and for future sales, instead of immediate profits, they will establish a permanent agency and business. That more firms are doing this each day shows that the business is growing to a firmer footing."

POSTOFFICE MOTOR SERVICE

The Huddersfield postoffice is noted for its efficiency and adoption of up-to-date methods for still greater improvement, says a consular report from Great Britain. The latest innovation is a motor-driven collecting service. On the first day a quarter of a ton of letters, etc., collected from a number of districts, was deposited in the post office at 7:30 p. m., an hour earlier than before, thus greatly facilitating the sorting, packing and departure of the mails. If the experiment continues successful, the service will soon be extended to all districts.

GAY Tags for Wolverines—The Michigan motor license tags for 1914, according to the announcement of the secretary of state, will have a white background with red letters and figures, a style that never before has been used in the state.

Motor License Bargain Sale—Secretary of State Martindale is having a bargain sale of Michigan motor car licenses. From now until January 1, 1914, the licenses will be sold at half price, or \$1.50 each. Next year the new law taxing motor cars according to their horsepower goes into effect.

Y. M. C. A. Runs Chauffeurs' School—The motoring school of the Y. M. C. A. at Columbus, O., turned out a number of graduated chauffeurs recently. The chief aim of the instructors of the school is to teach the students that safety is more important than speed. R. F. Nadig is at the head of the school.

Uses Gas 20 Years Old—After a tank of gasoline had been buried 20 years, Rev. Charles K. Weller, of Anniston, Ala., dug it up, filled his motor car tank and found the fluid in perfect condition. The tank had been buried in connection with a lighting system used in the house years ago and was dug up by accident.

Motor Vans Carry Brazil Mail—Motor vans are being installed by the Brazilian post office departments. Six cars of this class have been imported from Germany. If their operation proves economical it is understood that further orders will be placed by the government. The new cars are being used in Rio de Janeiro exclusively.

Armless Driver Visits Sixteen States—Frank E. Fithen of Steubenville, O., known as the armless speed king, passed through York, Pa., recently in his car on his way from Baltimore to Philadelphia. He was accompanied by his mechanic, W. C. Shannon. The two men, on a tour of the United States, have passed through sixteen states.

New Fad Causing Bother—The police of Boston are now watching for motorists who have adopted the new fad of having the lights on the sides of their cars show red and green like those on a ship at night, for complaints have been made that accidents and narrow escapes have resulted from mistaking the red light for a rear light. Under the law cars must carry two white sidelights at night.

Equips Car With Stove—Major R. B. Grubbs of the medical corps of the United States army has taken rank among the inventors of the motor car industry by an innovation which he introduced in his Rambler on a tour of 1,885 miles which he recently made from San Francisco to Tia Juana, Mexico. Major Grubbs' car is completely fitted for camping, after the adequate fashion of the army, but it also embodies one feature which is altogether new. A stove, which consists of six compartments, is incorporated in the machine, being built around the exhaust pipe, thus utilizing all the heat from that source.

Sue Truck Owner for \$34,000—Four suits amounting to \$34,000 have been brought against the Connecticut Breweries Co. of Meriden, Conn., as a result of an accident on Southington Mountain road in June of this year. A motor truck, owned by the brewery, struck a motor car belonging to Wilbur S. Dudley of Mt. Carmel. In the collision Junius S. Norton, president of the Home National Bank of Meriden, was killed and his wife was so badly injured that she died soon after. The driver of the truck was exonerated from all blame by Coroner Mix, who investigated the accident. His finding was that the steering gear became inoperative through loss of a nut shortly before the accident. The suits are brought by the administrator of the estate of the Nortons in which \$12,000 each is claimed for the death

of the husband and wife. In his own behalf the administrator brings suit for \$5,000 for himself, a like sum for his wife. The allegation is that the company owning and operating the truck was negligent in not having the steering gear in proper working order.

Fire Chief in Motor Business—George H. Byers, who until recently was chief of the Westfield, Mass., fire department, has now formed a partnership with L. L. Moore and under the firm name of Moore & Byers they have opened a garage and repair department in Park's block, Springfield, Mass. They will take the agency for cars and trucks as well as do a repair and general storage business.

Women to Decorate Cars—As a feature of the Iron county fair, to be held at Iron River, Mich., September 15, 16 and 17, something new in the line of a motor car parade will be held. Women will be required to do all the decorating of the machines for the parade and they will receive the prizes. Any woman may be assisted by other women and may even call for masculine aid, but the decorations must be her own design and all work must be done under her supervision.

Special License for Taxicabs—The police commissioner of Detroit announces that the law requiring a special license for taxicabs and sight-seeing cars will be enforced next year. The plan is to allow but two such vehicles in each block in the downtown section. In order to receive a license the owner of the car will have to prove that he has the consent of a merchant or property owner to stand in front of the latter's place. As it is at present these vehicles stand in strings for

blocks and as soon as one car moves out another takes its place. The result is that business men say that their customers are hindered in getting up to the curb in front of the stores or offices.

Motor Car Lamp Aids Firemen—At a recent fire which partly destroyed the hose tower at the rear of the Laurel engine house the immense searchlight on the motor car of Chief Wills of the York Pa., fire department played an important part in assisting the firemen to fight the blaze. The lamp was used to give the firemen light by which they might fight the fire from the inside of the building.

Use Motor Car at Mine—A Regal car is now in operation at the Banner mine near Bakersfield, Cal. A perpendicular shaft was started and derrick rigged up, and the machine hooked on to the end of the rope. A 600-pound bucket is speedily hoisted with the machine running on low gear, and all that is necessary is to keep extending the road out in front of the machine as the shaft gets deeper. The first 30 feet were sunk on less than 1 gallon of gasoline.

Schoolboys Build Motor Cars—By mere chance the boys of the Somerville, Mass., Industrial School were initiated into the mysteries of motor car building, and the interest aroused in the school was such as to induce the officials to include motor building and repairing in the regular curriculum. The school has a complete machine shop, carpenter shop and cabinet-making department, and when a motor car was wrecked and burned one day outside the school the boys got busy and repaired the machine as

Happenings Among the Good Roads Enthusiasts

BILLS placing all the highways in townships in Pennsylvania under the supervision of the state highway department, adding 77 new highways to the list of main state highways and changing fifteen of the routes in the act of 1911 were approved by Governor John R. Tener last week. The township road bill provides for election of township supervisors for 6-year terms and establishes a bureau of township highways in the state highway department, the superintendents of road districts being given authority to supervise the work of the township authorities. The bill for additional main highways covers about fifty counties of the state and provides that the highways shall be taken over June 1, 1915.

The improvement of the old National road from Columbus to the east corporation line of Ohio has been arranged for. Guernsey county, the last of the Ohio counties to take the matter up, has promised to give \$300,000, while the state will furnish \$120,000 for the paving of the road through that county. It is the intention to build a brick roadway 20 feet wide from the eastern limits of Ohio to Columbus.

Governor Emmett O'Neal of Alabama, who has decreed August 14, 15 and 16 as good roads days, will do manual labor during that time on the road. He asks that every citizen either give 3 days' labor or contribute 3 days' wages. By a state-wide co-operative movement of this kind the governor hopes to make such a showing on the roads that it can be made a yearly feature in Alabama.

Governor Edward Dunne of Illinois recently completed the organization of the state good roads commission which will have supervision of the distribution of \$1,100,000

for highway improvement during the next year and a half. A. D. Gash of Chicago was named president of the commission, with S. E. Bradt, a pioneer in the Illinois good roads campaign, and James Wilson as his assistants.

Balked by selfish office seekers, who are disgruntled at the adoption of a commission form of government, in attempts to vote bonds for public improvements, the progressive citizens of Pueblo, Colo., have made up for their lack of money for highway improvement by personally going out into the streets, contributing their labor, and encouraging others to do the same.

The Inland Automobile Association of Spokane is actively engaged in putting up road signs along the new Apple way near that city. The plan under which the signs are placed provides that the county furnish the labor and tools and the motor club provides the signs and the machines to transport them. The club emblem is painted at each end of the signboards and the mileage in the center.

The board of trade at Saginaw, Mich., has decided to name all roads in Saginaw county, and signs will be placed indicating the cities or villages or places of interest in both directions. It is thought that this will prove of great convenience to motoring parties.

State Highway Commissioner Frank F. Rogers of Michigan has sent out a bulletin explaining how the state will pay for the repair of roads. Two per cent of the appropriation for state road rewards is set aside each year as a repair fund and when repairs are made in conformation with specifications laid down by the state highway department this money is paid out on state reward roads.

Four Winds

well as if it had been done in a garage under expert machinists. A complete new body was made, the twisted and charred chassis was straightened out, wheels were repaired, tires put on and the car was ready to run.

Motor Laws More Drastic—Under the new motor law of the state of Wisconsin, the penalty for borrowing a car for a joy-ride has been raised from \$50 to \$1,000 or 5 years' imprisonment. Another drastic change is the penalty of a \$1,000 fine, instead of \$100, for the motorist who runs away after injuring a person or who refuses to give aid or reveal his identity.

Use Motor Car to Lay Rails—Owing to the construction of a railway between Tela, Honduras, on the Caribbean coast and Tegucigalpa, the capitol, a motor road is being built along the right of way. The American engineers in charge of construction will use motor cars in getting to the different portions of the work. There is talk of installing motor service over this road to be used during the period of construction. At present Tegucigalpa is almost inaccessible from the Atlantic side.

Teaching Law of Road—The Illinois Valley Automobile Association is trying to launch a campaign of education concerning the law of the road. Farmers and their wives in driving horse-propelled vehicles, are prone to keep the entire road and in turning out, to turn the wrong way, inviting accidents. Another cause for complaint is the practice of farmers permitting young children to drive restive horses that are easily frightened by motor cars. The frequency with which

horse-propelled vehicles are seen on the road at night without lights, is also cause for complaint.

Plan for St. Louis Show—At a meeting of the St. Louis manufacturers associations last Tuesday the motor show committee let contracts for the music and decorations at Forest Park Highlands, where the annual fall show is to be held the week of October 6. It is expected that this year's show will prove a banner one as many exhibitors already have reserved large spaces.

Damage Suit Sets Precedent—A decision in two suits in Connecticut is likely to establish a precedent. These two suits, totalling \$8,000, were brought as a result of an accident in Milford last year. A motor car, owned by Harry N. Hughes, was being driven by his daughter, Mabel. While crossing a narrow bridge a taxicab of the New Haven Taxicab Co. tried to pass it. The Hughes car either was struck by the taxicab or Miss Hughes became excited, for the car swerved, went through the rail and over into the brook. The woman was seriously injured and the car badly damaged. Miss Hughes was under age and did not have a driver's license, while the chauffeur was sitting in the rear seat. Judge Bennett held that the fact that the driver was sitting in the rear seat and not on the front seat beside Miss Hughes was negligence, a violation, in fact, of the law which provides that when a person, not a licensed driver, is operating a car, a licensed chauffeur must be with him. Counsel for the plaintiffs argued before the supreme court that all necessary precautions had been taken when the chauffeur was in such a place

that he was able to give advice and directions. This is the first time that such a point has ever been raised in the highest court in the state.

Drives Electric 97.2 Miles—A great deal of attention was attracted recently in Chicago motoring circles by the 97.2-mile run of a Borland electric roadster which was driven to Cedar Lake and return July 24 by the local Borland branch manager in order to attend the annual picnic of the Electric Vehicle Association.

Peruvians Favor American Cars—During the 12 months ending June 1, 1913, fifty American motor cars were sold in the republic of Peru, according to Vice-Consul Louis G. Dreyfus, Jr., at Callao. The American cars displaced the better known English and German competitors for three reasons: price, style and finish.

Barn Burns, Makes Record Run—A record run was made recently in a motor car, owned by Philip H. Glatfelter, Jr., from Spring Grove, Pa., to York, Pa., for chemicals when the large barn on his father's dairy farm was destroyed by fire. The distance is 10 miles and the trip was made in 25 minutes, 12 minutes going and 13 minutes returning.

Motorists in Detective Roles—Seventeen drivers of motor cars in Bloomington, Ill., have been appointed special police officers, serving without pay, to make reports on violations of the traffic ordinances. The names of those appointed will not be made public. They will be required to report all cases coming to their observation of violations of the city traffic regulations. Those at fault will be reprimanded and if there are succeeding offenses, fines will be assessed.

Pays Fine, Stops Check Payment—Regarding a fine of \$100 imposed by a justice court in the town of Old Lyme as a holdup, a New Jersey motorist tendered a check in payment of the penalty, and then stopped payment. Subsequently he had reason to believe that he could not get away with that dodge. Max Cohen, chief clerk in the secretary of state's office, immediately got busy when he was apprised of the details and got in touch with Joo Lippincott of the motor department of New Jersey. As a result the man who stopped payment on his check made good for the amount. The motorist excused himself on the ground that his chauffeur had told him the fine was a holdup.

To Extend Motoring Radius—Rainier National park, Washington's scenic wonderland, which skirts the base of the snow-capped Mount Tacoma, long has been a mecca for the motoring tourist. Close to 10,000 visitors passed through the gates to the park last year and of this number, nearly 70 per cent came by motor car. Plans are now under way for the extension of the motorists' radius. Machines are now required to stop at Nisqually Glacier, but they will be permitted to continue on to the Camp of the Clouds when appropriation is made for the widening of the present road leading to that point, which is the starting point for scaling the world famous peak.

Wins Russian Grand Prix—Coincident with the winning of the Anderson cup and Minneapolis Daily News cup by two Hupmobiles in the recent Glidden tour, comes word from St. Petersburg that a 20-horsepower Hupmobile runabout was victor in the first grand prix of Russia. The grand prix is an endurance contest somewhat similar to the American Glidden, but it is a great deal harder and taxes the car more severely. In the first place, no assistance is allowed a contestant. The car must get over the run entirely on its own merits, and the remarkable performance of the Hupmobile in negotiating the bad roads of Russia has caused considerable comment among the motoring public of the Russian empire.

Recent Activities Among the Motor Clubs of America

"SEE Michigan First" is the slogan of the Wolverine Automobile Club in arranging its sociability runs this season. Because Michigan once had the reputation for very bad roads many Detroit motorists have not had the courage to try touring near home and have shipped their cars by boat to Buffalo or Cleveland when starting on a vacation tour. The recent 1-day tour which touched the shores of sixteen lakes in Oakland county opened the eyes of these owners to the excellent condition of the roads in the adjoining counties. Other week-end trips are being planned by the club.

The newly organized motor club at Green Bay, Wis., has decided to incorporate under the laws of Wisconsin as the Brown County Automobile Club, with headquarters at Green Bay. The club will start out with 137 members, and hopes to gain 100 more before the end of the year. Elmer S. Hall, secretary of the Green Bay Commercial Club, will be secretary and business manager. It is hardly likely that the club will form an affiliation with the Green Bay Yacht club insofar as the use of the yacht clubhouse is concerned, until the motor club is proven to be a financial success. Good roads work will form a feature of the new club's activity.

The Wilmington Automobile Club of Wilmington, Vt., was formed a few days ago when motorists in that vicinity got together and elected the following officers: President, F. S. Crafts; secretary and treasurer, F. L. Schuster; F. A. Childs, Roy Courtemach and L. A. Brown, with the president and secretary-treasurer, board of directors.

All the motor clubs of Missouri have gotten together and will purchase a motor car for Colonel F. Buffum, state highway commis-

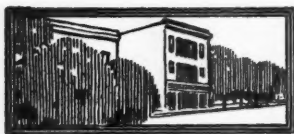
sioner, so that he can tour over the roads of the state with more regularity than is now the case.

The Illinois Valley Automobile Association, organized a year ago, has rapidly increased in membership and influence and is now one of the most successful organizations of the kind in the state. At the annual meeting recently, new officers were elected as follows: President, H. M. Orr, La Salle; first vice-president, N. J. Cary, Utica; second vice-president, L. M. Eckert, Princeton; secretary, Horace Hull, Ottawa; treasurer, C. W. Knapp, Spring Valley.

Olympia, Wash., now has a full-fledged motor club, with C. J. Lord as president and W. L. Bridgford as secretary. Over 200 members have thus far joined the club.

Jesse Taylor of Jamestown, Ohio, editor of Good Roads, the official publication of the Ohio Good Roads Federation, has been elected general secretary of the National Highways Association at Washington, D. C.

The Centralia Automobile Club and the Centralia Commercial Club, of Centralia, Mo., are preparing to shorten the northern route state highway across Missouri by opening a new road between Centralia and Mexico, Mo. This will shorten the present route about 4½ miles and eliminate several hills. All the bridges will be of concrete and the road will be kept in perfect condition. The Northern Route highway, or Prairie route, is marked from New Florence, Mo., to Kansas City with three white rings, and there is a move on foot to put up larger highway markers. The road between Centralia and Sturgeon, Mo., will also be shortened, straightened, made wider and put in first-class condition.



Among the Makers and Dealers



CANADIAN Makers Land Yankee—C. R. Burt, of Rockford, Ill., has been appointed factory manager of the Russell Motor Car Co., of Toronto, Can., in succession to Mr. MacDonald, who recently resigned.

Building 1500-Pound Truck—The Butler truck, weighing 1500 pounds and equipped with a Continental motor, Timken axles, Bosch magneto and pneumatic tires, is now being built by the Huselton Automobile Co. of Butler, Pa.

Planning Plant Extension—The Hewitt Rubber Co. has filed plans in Buffalo for the construction of a new three-story brick factory at 240 Kensington avenue, to cost \$175,000. Work will be started on the new building within the next 3 weeks.

To Make Motor Truck Tire—C. E. Herman and S. C. Munson of 55 West Blake avenue, Columbus, O., have secured a patent on a new motor truck tire and are organizing a company to manufacture it. The principal feature of the tire is a steel shoe which is fitted on the tread of the tire to receive the wear.

Sells Riveter Output—Samuel S. Eveland, owner of the Eveland Engineering and Mfg. Co., Philadelphia, has sold the entire production of his factor of electric riveters of an approximate valuation of \$1,500,000.00, for the first year, to Manning, Maxwell & Moore, with headquarters at 85 Liberty street, New York City.

Federal Enlarges Plant—The large addition to the plant of the Federal Motor Truck Co. of Detroit, which will increase the floor space 33 per cent, will be ready for occupancy within 30 days. This addition to a factory that was already extensive was made necessary because of the demands for increased production.

Auto Parts Co. to Move—Owing to the large volume of business in the city and country, the Auto Parts Co., at present located at 513 to 531 West Jackson boulevard, Chicago, has leased for a long term the entire building at 737-739 West Jackson boulevard, now being remodeled. The entire first floor, over 7,000 square feet, will be used exclusively for sales room.

Battery Makers in Merger—The Manhattan Electrical Supply Co. has purchased the business and plant of the Rock Island Battery Co. of Cincinnati, O., and took possession August 1. This move will not mean the discontinuance of the Rock Island brands of dry battery, for they will be manufactured in addition to the Red Seal, Hi-Up, Blue Seal and Mesco batteries, now made by the Manhattan Electrical Supply Co. at its other factories.

To Sell New Tire Filler—With the recent awakened interest in tire healing compounds comes the announcement of the opening of a branch house of the Always Air Mfg. Co., at 692 Woodward avenue, Detroit, under the name of the Always Air Sales Co. The product offered by this concern is a fluid to be put into the inner tubes of pneumatic tires for the purpose of healing up punctures and slow leaks. It is said to contain asbestos in its make-up and to be manufactured under two patents. There are now branches and factories in New York, Kansas City and Los Angeles and the new branch in Detroit, together with a proposed factory, are expected to take care of the middle west and eastern territories. The officers of the Detroit sales company are Colonel R. P. Dickerson, president; Barney

Oldfield, vice-president; Leon T. Ketchel, branch manager; E. L. Bales, general manager; and G. M. Kinsella, special representative.

Akron Gear Increases Capital—The Akron Gear and Engineering Co. of Akron, O., has filed papers with the secretary of state increasing its capital stock from \$20,000 to \$50,000.

Files Bankruptcy Schedule—A schedule has been filed with Referee in Bankruptcy Wicks by L. W. Coppock, assistant secretary and treasurer of the Grand Rapids Motor Truck Co., showing the liabilities of the company to be \$124,239.74 and the assets to be \$110,006.81. Frank T. Hulswit and the

Old National Bank of Grand Rapids are among the heaviest creditors. The first meeting of the creditors of the company will be held September 16.

Coleman With Atterbury Motor—J. R. Coleman, formerly with the Chalmers and Packard companies, and lately of the E. R. Thomas Co., has returned to Detroit to take up the duties of chief engineer of the Atterbury Motor Co.

Lozier to Build Own Motors—An emphatic denial to the story that the Lozier Motor Co. will abandon the manufacture of its motors has been issued by N. R. Feltes, treasurer of the Lozier company. Appearing originally in a Muskegon, Mich., paper, the article pur-

Recent Incorporations

Akron, O.—Seaton Metal Products Co., capital stock, \$20,000; to manufacture and deal in accessories; incorporators, L. J. Rothenbecker, C. A. Seaton, W. O. Lee, C. F. Miller, C. Scimeca.

Baltimore, Md.—American Motors Co., capital stock, \$500,000; incorporators, F. A. Hyde, F. B. Smith, C. G. Guyer.

Boston, Mass.—Universal Safety Tread Co., capital stock, \$115,000; directors, E. T. Smith, C. G. Clark, W. T. Hamilton.

Buffalo, N. Y.—Biggam Engineering Co., capital stock, \$200,000; to manufacture transmissions, clutches and parts; incorporators, H. F. Biggam, N. D. McDowell, C. E. Buck.

Canton, O.—Forest Rubber Co., capital stock, \$10,000; to deal in rubber goods and tires; incorporators, H. H. Forest, E. C. Purdy, A. D. Evans, F. J. McMillan, W. Kline.

Cleveland, O.—General Auto Parts Co., capital stock, \$1,000; incorporators, F. C. Walsh, M. Kenke, W. Radtke.

Cleveland, O.—Arter Auto Body Co., capital stock, \$20,000; to manufacture bodies; incorporators, E. Younger, F. S. Rice, J. S. Castle, W. E. Freese, W. T. Redmond.

Cleveland, O.—Modern Garage Co., capital stock, \$10,000; to deal in motor cars; incorporators, E. E. Terrell, A. F. Pliske, Max Pliske, R. M. Ostrander, V. E. Davis.

Columbia, S. C.—Easley Auto Sales & Repair Garage Co., capital stock, \$1,000; incorporators, A. F. Day, J. L. Bolt, G. Wyatt, W. D. Sitton.

Detroit, Mich.—Overland Detroit Co., capital stock, \$10,000; incorporators, C. E. Baker, H. O'Donnell, S. C. Fisk.

New York—Zip Sales Co., capital stock, \$15,000; to deal in motor car supplies; incorporators, G. W. Phillips, Jr., V. W. Cutting, A. E. Hall.

New York—Knight Tire and Rubber Co., capital stock, \$5,000; incorporators, J. C. Nichols, W. B. Hughes, D. L. Fultz.

New York—Bobra Spark Plug Co., capital stock, \$12,000; to manufacture spark plugs; incorporators, W. Bohlbeber, C. H. Braselton, C. L. Bundy.

New York—James J. Fero, capital stock, \$20,000; to engage in tire business; incorporators, J. J. Fero, G. D. Brown, W. S. Foos.

New York—F. D. Homan, capital stock, \$2,000; to deal in motors; incorporators, F. D. Homan, B. Jackson, A. E. Kannengeiser.

New York—Caledonian Oil Co., capital stock, \$10,000; to produce and deal in lubricating oils, etc.; incorporators, J. E. Hernandez, A. B. Brushaber, H. Hess.

New York—Consolidated Auto Supply Co., capital stock, \$500,000; incorporators, H. O. Coughlan, F. Schmidt, J. M. Satterfield.

New York—Motors Owners Associated, Inc., capital stock, \$10,000; incorporators, J. C. Travis, C. L. Clune, M. M. Hovey.

Norwich, Conn.—Co-operative Auto Co., capital stock, \$50,000; incorporators, R. J. Jodoin, J. A. Allen, J. H. Brown, J. Quinn.

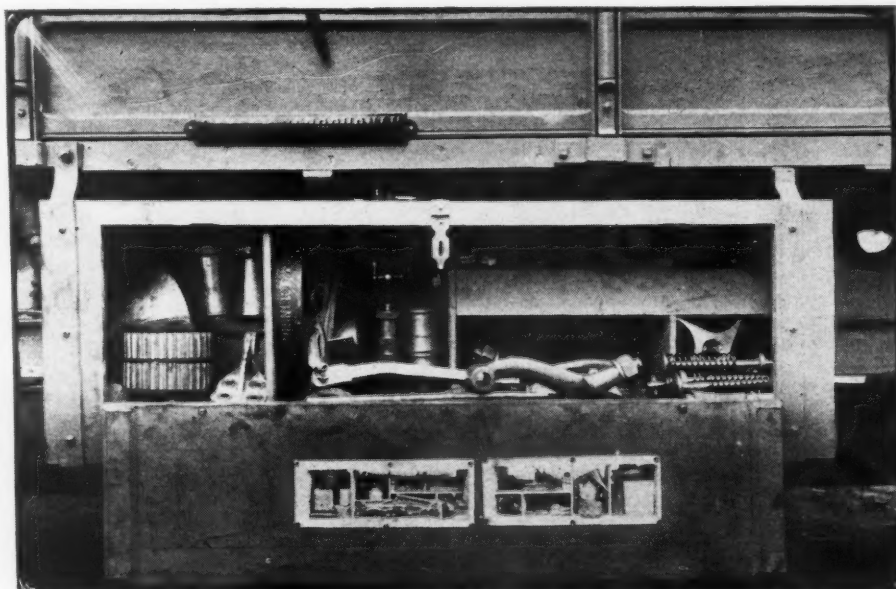
Spokane, Wash.—Spokane Auto Mfg. Co., capital stock, \$50,000; to manufacture and sell trucks; incorporators, E. A. Torrance, R. L. Dickerson, P. H. Witschge.

Springfield, Mass.—Baxter-Chesebro Co., capital stock, \$10,000; motor car business; incorporators, W. H. Baxter, J. W. Chesebro, G. A. Bacon.

Stamford, Conn.—North Stamford Ave. and Long Ridge Road Auto Bus Co., capital stock, \$10,000; incorporators, M. J. Potter, J. F. Dunn, H. Miller.

Wilmington, Del.—International Metal Wheel & Supply Co., capital stock, \$100,000; to manufacture wheels.

Wilmington, Del.—Brookes Motor Car Co., capital stock, \$5,000,000; incorporators, C. B. Bishop, C. J. Jacobs, H. W. Davis.



HOW TOOLS AND SPARES ARE CARRIED ON DE-DION-BOUTON TRUCK IN FRENCH TRIALS

porting to be an interview with an official of the Continental Mfg. Co., stated that the Muskegon concern would make Lozier motors in 1914.

Vacation for Truck Builders—The Sandusky Auto Parts and Motor Truck Co. of Sandusky, O., has laid off its motor department force of 325 men for 3 weeks. Manager Dan E. Storms states that during the shutdown the capacity of the plant will be increased one-third.

Record July for Oakland—Just to prove that July can be an exception to the rule and is a better sales month than a good many manufacturers imagine it to be, George E. Daniels, vice-president and general manager of the Oakland Motor Car Co., sends out the statement that the daily July shipments of Oakland cars for the month averaged fifty-one cars.

King Owners Makers' Guests—An innovation has been carried out by the officers of the King Motor Car Co. of Detroit in the renting of the Bannister cottage at Lake Orion, Mich. Last week all the owners of King motor cars in Wayne county were invited to spend the week-end at the cottage. It has become a regular thing for the company to entertain its dealers and salesmen at the lake over Sunday.

Lamp Makers Increase Capital—The rapid growth in the business of the John W. Brown Mfg. Co. of Columbus, O., maker of motor car lamps, has necessitated the increase of the authorized capital of the corporation from \$490,000 to \$640,000 to provide for the new plant being erected on Marion road. Of the increase in capital the common stock is increased from \$220,000 to \$270,000 and the preferred stock from \$270,000 to \$370,000.

Rambler Adds to Power Plant—Another giant cross compound engine, directly connected to a huge alternating current generator, has been installed in the big Jeffery works at Kenosha. This new unit, which comprised in shipment fourteen car loads, with a total weight of over 500,000 pounds, has a capacity of 2200 horsepower and will have for its foundation a concrete block weighing approximately 3,000,000 pounds. The flywheel of the engine, owing to its high rim velocity of 7,000 feet per minute, is cast entirely of steel. Its diameter is 23 feet and it weighs 60 tons. The generator alone has a total weight of over 70 tons. This great revolving mass of steel has a total weight of 160 tons and rotates at 100 revolutions per

minute on a crankshaft which is 22 feet long and weighs 32 tons. In addition to this new power unit, the Jeffery power plant is equipped with smaller units, making a grand total capacity of 3,925 net horsepower.

Willemin Hupp Purchasing Director—The position of purchasing director of the Hupp Motor Car Co. has been filled by A. B. Willemin. C. H. Brennan, who formerly held this post, resigned for the purpose of going into business for himself.

Truck Plant for Gibsonburg—Plans have been prepared for a new factory building for the National Motor Truck and Mfg. Co. to be located at Gibsonburg, O. It is announced that \$100,000 of the authorized \$250,000 capital has been subscribed.

Sutton Joins Continental Motors—F. W. Sutton, formerly production manager of the American La France Fire Engine Co., and also of the Frank B. Stearns Co., has taken the position of production manager of the Continental Motor Co., of Detroit.

Additions to Faultless Plant—The Faultless Rubber Co. of Ashland, O., has purchased a large tract of land adjoining its plant upon which several large additions to the plant will be erected. R. W. Miller has been elected president and Charles Campbell general manager for the coming year.

MacNab Moves to Chicago—The J. I. Handley Co. of Indianapolis, recently organized to distribute American and Marion motor cars, will have the co-operation of M. D. MacNab, vice-president of the Marion Motor Car Co., who hereafter will make Chicago his headquarters and direct the affairs of the Handley company in the central states.

Traction Expert Joins Firestone—R. E. Lee has resigned as general superintendent of the Cincinnati Traction Co. of Cincinnati to become connected with the Firestone Tire and Rubber Co. of Akron, O. Mr. Lee began his street railway career in Baltimore in February, 1886, as a conductor on the horse car lines of the Baltimore City Passenger Railway Co.

Overland Output 33,000 Cars—It is understood that the Willys-Overland Co. has concluded production and sale of its 1913 cars and will very shortly begin outputting its 1914 models. The season which ended about July 10 was highly successful, witnessing an output of just 33,000 cars, against 24,000 in 1912. This is easily the best year the company has ever had, not only in gross but in

net. It is understood that gross, including motor truck sales, will cross the \$30,000,000 mark, while net profits are expected to approximate \$4,500,000.

Tires in Military Trials—Of the ninety-eight motor trucks engaged in the military trials in France, seventy-six, or 78 per cent, are equipped with Gaulois Bergougnan tires. Twelve of the vehicles are equipped with Continentals and two each with Hutchinsons, Goodrich, Lutitia, Graumont and Dunlop. The trials are still on.

Ward Leonard Building Addition—The Ward Leonard Electric Co., of Bronxville, N. Y., is building an addition, now nearing completion, on the northeast wing of the factory. This will greatly facilitate the company in handling the increase of business and will enable it to triple the present output.

Start Building Champion Cars—The Champion Motor Car Co. has taken possession of its factory in Minneapolis, at Fourteenth avenue and the Northern Pacific tracks. It employs thirty men. Six and four-cylinder machines will be made. The six will be 50-horsepower and the four a 36. Wheels will be wood or wire.

Goodyear Opens Service Station—A service station exclusively for the use of users of Goodyear tires will soon be opened in Cleveland. The Goodyear Tire and Rubber Co., of Akron, O., has leased a 3-story building at 5213 Windsor avenue which will be used for this purpose. There will be special equipment for repairing and changing commercial motor vehicle tires.

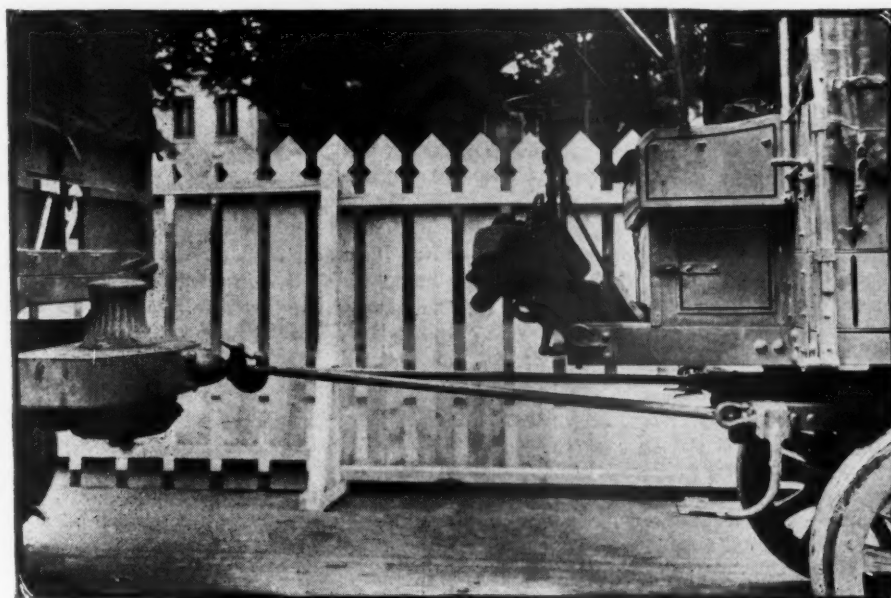
Open Branch in Cleveland—The Merchant & Evans Co., maker of motor car tubing, tire cases, ventilators and grease cups, recently moved into its new warehouse, 315-317 Champlain avenue, Cleveland, O. J. C. McIlroy, who formerly represented the company in the middle west, is manager of the Cleveland branch.

Not Interested in Car Company—The McCord Mfg. Co. of Detroit, manufacturer of radiators, lubricators, etc., wishes it known that neither it, A. C. McCord of Chicago, its president, or other of its officers or stockholders, are directly or indirectly interested in the McCord Automobile Co., which by press reports has recently been incorporated, or any other motor car venture.

Purchase Vulcan Gear Works—Confirmation of the report that the Studebaker Corp. had purchased the plant known as the Vulcan Gear Works at Pontiac, Mich., was made last week when work was started at the factory. According to General Manager Booth of the Studebaker Corp. the factory will be utilized in the manufacture of gears for the Studebaker line of cars and will be kept in continuous operation.

Evansville Truck May Move—The Evansville Commercial Truck Co. of Evansville, Ind., is negotiating for the factory recently vacated by the Reliance Motor Truck Co. at Owosso, Mich. The matter has been referred to the industrial committee of the Owosso Improvement Association. It has been rumored that the General Motors Co. would conduct some other branch of its business in the old building after the removal of the Reliance plant.

Chevrolet Moving to Flint—The Chevrolet Motor Co., which is closing its plant at Detroit, is moving to Flint, Mich., as rapidly as possible, and soon will be installed in its new plant at Hamilton avenue and St. John street. A number of chassis were driven through from Detroit to Flint. Stock supplies are on the ground, and a force of workmen is busy preparing for the opening of the assembling, trimming and painting departments. The company expects to complete the work of removal soon and to be ready to begin operations by September 1.



CAPSTAN AND COUPLING ON SAUREL TRUCK IN FRENCH MILITARY TRIALS NOW IN PROGRESS

With Accessory Makers

Motometer Junior

THE Motometer Co., Inc., New York, has brought out another motometer model called the Junior, selling for \$5. This device is threaded into the radiator filler cap and tells the driver of the vehicle the temperature of the radiator, so as to enable him to determine whether or not his motor is running too hot. It acts just like a thermometer. If there is insufficient water in the radiator, the little water remaining will get excessively hot and this will be registered by the device. If the water turns to steam the motometer will show this. If reference is made to Fig. 4 it will be seen that the scale has a number of registrations upon it. The tube in the middle contains a red liquid and as the temperature of the radiator water rises the red liquid rises in the tube and indicates the thermal condition of the motor.

A mistake often made by motorists is in neglecting to make a motometer correction for altitude. It should not be expected that the instrument read the same at sea level as it would on top of a mountain. Recently a report was circulated that the motometer did not register correctly at high altitudes. A correction of 2 degrees for every 1,000 feet should be made. That is, at sea level water boils at 212 degrees Fahrenheit, but at 5,000 feet above sea level it will boil at 202 degrees.

Fulton Adjustable Vise

The Fulton Machine and Vise Co., Lowville, N. Y., is marketing a vise which may be attached to any form of bench and which may be made to assume any desired position in any direction. The vise is illustrated in Fig. 2. The jaws J of this vise may be swung sideways as shown by the dotted lines, or the entire barrel B made to occupy a position to the left or right. By lifting up on the

wingnut T the barrel and the jaws as a unit may be turned around to the left or right. The jaws are movable up or down but, as soon as something is inserted between the jaws they hold the position

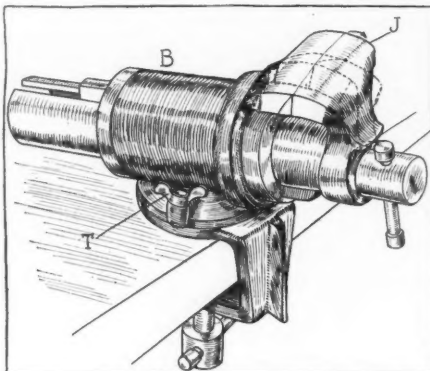


FIG. 2—FULTON ADJUSTABLE VISE
The jaws of this vise may be placed in any desired position

they were in when the object was placed between them. Thus, if one had to work with the vise attached to a fence on the roadside and it necessitated that the jaws be placed at an angle of 45 degrees, it would mean simply the swinging of the jaws to the desired position and the insertion of the object between the jaws. They remain in the position set when the object is inserted and the jaws tightened.

Norisko Steering Gear Lock

Motorists and also risk insurance companies will be interested in another device which prevents the misuse and theft of motor cars. This device, manufactured by the C. J. Rogers Mfg. Co., Philadelphia, Pa. is claimed to securely lock the

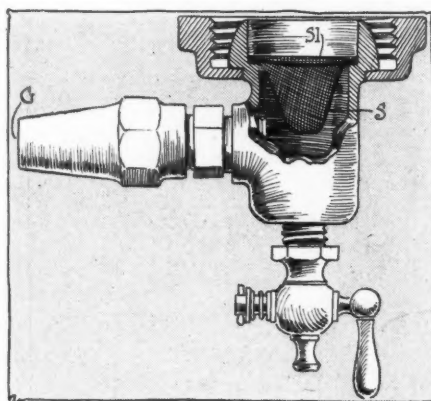


FIG. 3—STROMBERG FUEL STRAINER
This device is said to prevent dirt from passing to the mixing chamber

steering post. Norisko is name given to the lock and it consists of a shackle fastened to the steering post by a screw arrangement. Within the shackle is a plunger which when pushed in slightly opens or breaks an ignition circuit, and

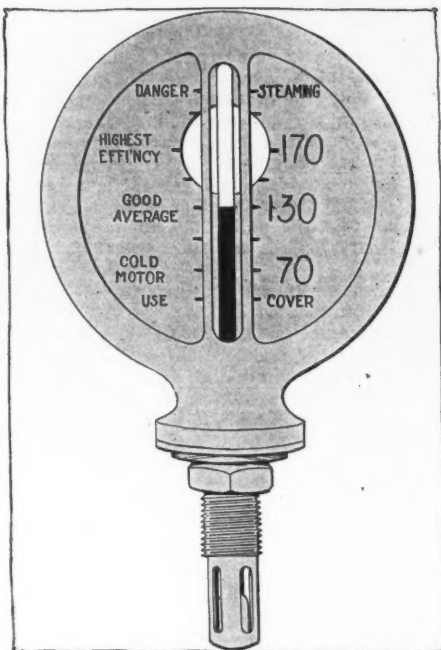


FIG. 4—MOTOMETER JUNIOR
When reading this instrument deduct 2 degrees for every 1,000 feet altitude

when pushed all the way in engages with a slot in the steering post proper, thus locking it. The lock is freed by turning a key.

Double Fuel Strainer on Stromberg

For the coming year the Stromberg Motor Devices Co., Chicago, will equip its carbureters with fuel strainers, which are said to permit the gasoline to pass to the float chamber in a perfectly clean state. The strainers appear in the form of wire screens, one a round flat screen and the other shaped like a thimble. The positions these screens take are shown in Fig. 3 by the letters S and S1.

The gasoline entering the carburetor at G strikes the lower screen immediately upon entering. By passing through the lower screen the fuel is cleaned of its dirt. A second cleaning is given the fuel by the upper screen S1, and after leaving it the fuel is said to be free from all foreign matter. The water drops to the cup like portion to which the drain cock is attached. The dirt collects here also. It is suggested by the Stromberg company that each week or so, the drain be opened to permit of the passing out of sediment and water.

Rushmore Electric Starter

By simply pressing a button the Rushmore electric starter, manufactured by the Rushmore Dynamo Works, Plainfield, N. J., will spin a 60-horsepower engine at 80 r.p.m. The starter is of the unit type and operates at 6 volts. By referring to Fig. 5 an idea of the operation of this device may be gained. It will be noticed the pinion at the end of the armature shaft is geared

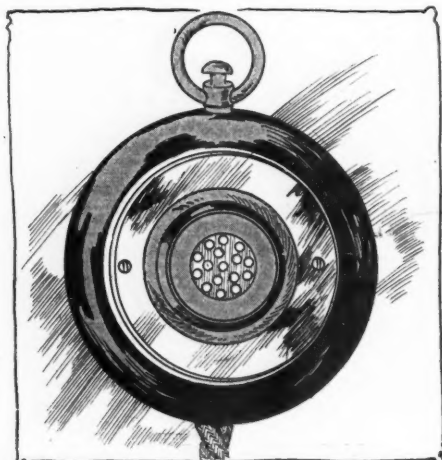


FIG. 1—PRESTO CIGAR LIGHTER FOR FORDS

Operates from the magneto and may be placed in any part of the car

directly to the flywheel of the motor. When this gear engages or disengages with the flywheel the entire armature moves backward or forward as may be the case. The method of engaging and disengaging the armature is the feature of the starter. The armature is displaced endwise by means of a spring, contained in the hollow shaft. The spring bears with a pressure of about

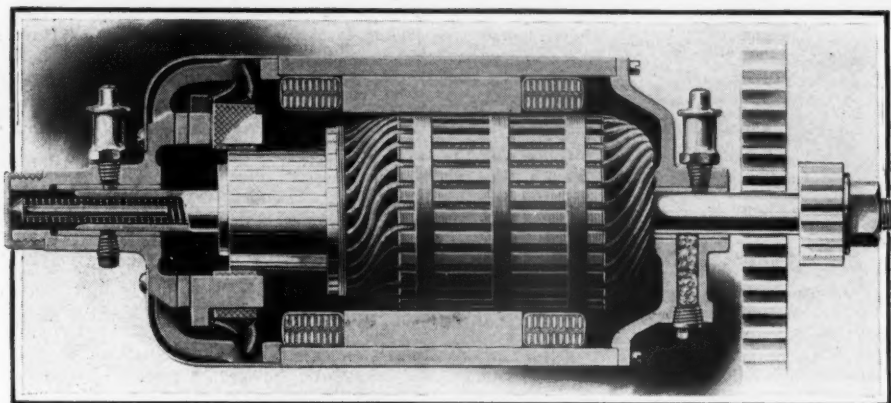


FIG. 5.—SECTIONAL VIEW OF RUSHMORE ELECTRIC STARTER

The pinion is at the end of the armature shaft, which slides back and forth automatically

15 pounds against a plunger, as shown in the illustration. When the starting switch is closed the normal attraction of the field magnets sucks the armature into its proper position and then the armature starts to revolve. The moment the engine picks up speed the starting motor is relieved of its load. At this point the solenoid action ceases and the spring pushes the armature back to its normal position and the armature and pinion spin idly until the operator removes his foot from the switch.

To carry out the detail of the system the switch is given two active contacts. The first contact partially short-circuits the armature so that it rotates only enough to make sure that the pinion will slip into mesh easily, while a resistance limits the current flow to that required to excite the field magnet. On the second contact the short-circuit is removed and the resistance cut out, and the motor then exerts its full power to turn over the engine. The switch movement is opposed by a spring with sufficient stiffness that the movement shall not be too abrupt.

Pruden System Garage

With a screwdriver and a monkey wrench one may erect a garage. This may seem impossible, but according to the manufacturer of the Pruden system garage, the Metal Products Co., Chicago, it is true.

The garage offered is of steel and is claimed to be vandal-proof. The windows are bar locked, while the doors have a double bar arrangement, which is said to prevent the entry of those desiring to test the car within to see if it can travel over 60 miles an hour. Another feature of this portable garage is the fact that it is fire-proof, instances having been recorded by the maker in which the car housed was burned but the garage left intact. There is nothing barnlike in its appearance, a re-

production of this portable building being shown in Fig. 6 to give one an idea of its simplicity and neatness.

Williams Exhaust Regulator

In some pressure fuel feed systems, the exhaust gas is used to create the desired pressure in the tank. In order to remove all dirt, carbon and moisture from this exhaust gas, the D. T. Williams Valve Co.,

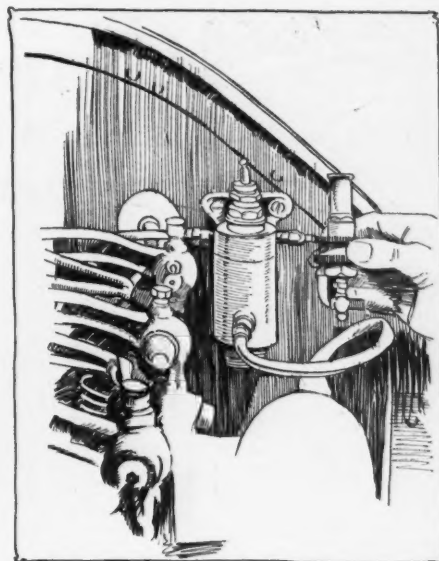


FIG. 7.—WILLIAMS EXHAUST REGULATOR

It is attached to the dash as shown and cleans the exhaust gas before it reaches the gasoline tank

Cincinnati, O., has devised an exhaust pressure regulator. This device, illustrated in Fig. 7, is attached in a vertical position on the motor side of the dash and takes the gas before it enters the fuel tank and cleanses it. The gas is conducted over a series of ribs inside the casing, which operation is said to separate all dirt, carbon and moisture, the solid matter dropping to the bottom of the regulator. From here it is drained periodically through a cock. It is stated also by the manufacturer that the temperature of the gas is lowered considerably in its passage through the regulator, making it more adaptable for use.

Vanderpool Shop Steam Vulcanizer

A tire repair outfit constructed especially for garage and shop use is being marketed

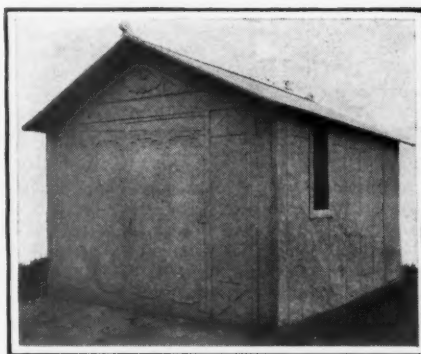


FIG. 6.—PRUDEN PORTABLE GARAGE

The only tools necessary for its erection are a screwdriver and a monkey wrench

by the Vanderpool Co., Springfield, O. This steam vulcanizer illustrated in Fig. 8, will do cavity work with tires up to 5-inch section. For blisters and cuts a shallow tread mould is supplied. For tube repairing a plate is provided which will handle as many as five tubes

at one time. The boiler is of one piece, 8 inches in diameter and 10 inches long, with twelve flues. This boiler is claimed to generate 40 pounds of steam in 15 minutes. As optional equipment the maker will install a gas or gasoline burner. The vulcanizer weighs 335 pounds and sells for \$65.

Presto Cigar Lighter for Fords

A cigar lighter operated from the magneto of a Ford car is being marketed by the Metal Specialties Co., Chicago. This lighter is shaped like a watch, as may be seen by referring to Fig. 1. Attachment to the magneto is very simple and any owner may install the device himself. The tip, or that portion in the illustration with the numerous holes, is made to give enough heat to light a cigar, by pressure on the small button at the top. The Presto cigar lighter is made also to operate from 6, 12 and 24-volt batteries, special tips being supplied for each voltage.



FIG. 8.—VANDERPOOL STEAM VULCANIZER

The boiler of this device is said to generate 40 pounds of steam in 15 minutes



Brief Business Announcements



Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Boston, Mass.	Wentworth-Fosdick Co.	Hupmobile	Minneapolis, Minn.	Twin City Motor Car Co.	Hudson
Boston, Mass.	H. J. Koehler Co.	Grant	Portland, Ore.	Boone-Skinner & Co.	Maxwell
Columbus, O.	Murnan Taxicab Co.	Speedwell	Ridgeville, Ind.	J. C. Carpenter	R. C. H.
Columbus, O.	Murnan Taxicab Co.	Alco	Salem, Mass.	Flynn Motor Co.	Henderson
Columbus, O.	Murnan Taxicab Co.	Moon	St. Clair, Pa.	S. H. Daddow	R. C. H.
Columbus, O.	Auto Inn and Exchange	King	St. Louis, Mo.	Weber Implement and Auto Co.	R. C. H.
Detroit, Mich.	Grant Brothers Auto Co.	Chandler	St. Louis, Mo.	Lewis Auto Co.	Marlon
Lawrence, Mass.	Herbert Ellis	Studebaker	Taunton, Mass.	Shorts Garage	R. C. H.
Los Angeles, Cal.	California Moline Plow Co.	Cartercar	Terry, Mont.	L. W. Lamb	R. C. H.
Los Angeles, Cal.	Smith Brothers	Peerless	Trenton, Mo.	Joseph Kelso	R. C. H.
Louisville, Ky.	Thomas M. Carr	Kisselkar	Wichita, Kan.	Jones Auto Exchange	R. C. H.
Louisville, Ky.	Louisville Lozier Co.	Chandler	Wichita, Kan.	J. J. Jones	Wahl
Marion, Ind.	Shawley & Stick	R. C. H.			

COMMERCIAL CARS

Hartford, Conn.	Curtis & Dean	Lauth-Juergens	St. Louis, Mo.	Leerless Sales Co.	Selden
San Francisco, Cal.	Osen-McFarland Co.	Commercial			

NEW YORK—The H. J. Koehler Co. will act as the eastern distributor for the new Grant car.

Toronto, Ont.—Edgar Walker has opened an agency for Gaulois tires at 127 Bay street, Toronto.

Wellesley, Mass.—R. W. Selfe, an electrical contractor at Wellesley, Mass., has taken over the Wellesley garage and has changed its name to the Selfe garage.

Upper Sandusky, O.—C. W. Kotterman has opened a garage and repair shop on West Wyandot street, Upper Sandusky, O. He has taken the 1914 agency for the Studebaker.

Boston, Mass.—The New England branch of the Oakland Motor Car Co. has been moved from Boylston street, Boston, Mass., to the corner of Massachusetts avenue and Newbury street where the United Motor Boston Co. had its salesrooms.

Providence, R. I.—Howard B. Campbell, who formerly was with the Rhode Island Motor Car Co. and the Pope-Hartford Auto Co., has leased the repair shop and garage that the former company conducted at 69 Broad street, Providence, R. I., and will carry on the business.

Detroit, Mich.—The Auto Sand Grip Co. has opened headquarters at 690 Woodward avenue. The officers, all residents of Detroit, are J. Fletcher Williams, president and general manager; Philip G. Sanderson, vice-president; and C. B. Shotwell, secretary-treasurer.

Baltimore, Md.—The American Auto Sales Co. has been organized to handle the American in this city and state. Officers of the company are E. M. Newton, president; F. S. Cortez, vice-president; Hyland P. Stewart, Jr., secretary-treasurer, and L. E. Lipsey, sales manager. The company is located at Maryland and North avenues.

St. Louis—The Stewart-Warner Corp.'s local branch has been absorbed by the Speedometer and Supply Co., with Roy W. Brandt, former manager of the Warner people here, as district representative. W. H. McKim is manager of the Speedometer and Supply Co. and will maintain a service department at 3333 Olive street.

Detroit, Mich.—The most important change in some time along Detroit's newer motor row is the purchase of the W. J. Marshall Auto Co. by the Wetmore-Quinn Co. The Marshall company, under the management of R. Albertus, was a very successful agent of the Paige-Detroit in the local territory and also carried on a garage business in which lines its successor will continue. It is also

probable that it will add another line when larger quarters are secured in the near future.

Piqua, O.—The Piqua Auto Supply Co. is the name of a new supply concern located at 133 North Main street, Piqua, O. Walter R. Snyder is general manager.

Guelph, Ont.—W. T. Doughty of Guelph, Ont., has purchased the garage on Eramosa road from W. G. McConnell, and will take over the latter's business.

Chicago—Logan Greenwell, who has been associated with F. E. Sparks, Chicago, for the past 4 years, has gone into business for himself at 1322 Michigan avenue, Chicago, as a manufacturers' agent.

Columbus, O.—Herman Eckhart, Jr., has been placed in charge of the new sales rooms of the Columbus Buggy Co., located at 48 North Fourth street, Columbus.

Des Moines, Ia.—The Clemens Automobile Co. is the new name of the Des Moines Overland agency. This concern, under the same management, has been known heretofore as the Ridell Automobile Co.

Boston, Mass.—Carl Spiegelberg, who has been with the factory sales force of the Metz Co. for some years, has been placed in charge of the New England branch opened last week at 885 Boylston street, Boston, Mass.

Columbus, O.—The Guarantee Tire and Repair Co. is the name of a new concern which operates at 149 North Fourth street, Columbus. The company is the local agent for the Tyrian tire, made at Andover, Mass. Jack Reed is general manager.

Columbus, O.—F. E. Avery, who has been in the motor business for the past 14 years and who is the local dealer for the Packard, announces that he will again assume full control of the local branch. Mr. Avery has been in poor health for the past 2 years.

Cleveland, O.—The incorporation the past week of the Overland-Garford Sales Co. marks the passing of the Western Reserve Motor Car Co., former local Garford representative. George Bridgeman, formerly connected with the sales department of the Willys-Overland company at Toledo, is general manager of the new company.

Albany, N. Y.—The E. V. Stratton Co. 1914 territory for the Hudson has been increased to include all of New York state west to and including Montgomery and Franklin counties and south part of Ulster and Dutchess; five counties in Vermont and three in Massachusetts, including Springfield. John S. Harrington, formerly of Worcester and Boston,

has been engaged by the Stratton company to handle its Springfield district on Hudson cars and Stewart trucks.

Detroit, Mich.—Puncturine, a puncture-curing compound, is being manufactured and distributed from a new plant at 676 Woodward avenue.

Carey, O.—R. D. Hilty has sold his garage located on North Vance street, to Coral Stevens and Clarence Baughman, who will operate it in the future.

Greenville, O.—S. H. Swope, who operates the Overland and Chalmers agency at 313 Broadway, Greenville, O., has sold the business to E. R. Swinger.

Conshohocken, Pa.—The Lee Tire and Rubber Co. has added to its list of distributors the Lee Tires Sales Co., Newark, N. J.; the Lee Tire and Rubber Co. Agency, Brooklyn, N. Y.

Louisville, Ky.—The Hiter Motor Car Co., agent for the Henderson, has moved its salesroom from the Franklin building on Fourth avenue, near Broadway, to the northwest corner of Fourth and York streets.

Louisville, Ky.—The Rommel Motor Car Co., local distributor of Studebaker and White cars, has closed its office and salesroom at Fourth and York streets. The headquarters hereafter will be at 901 East Broadway.

Detroit, Mich.—The Keeton Motor Car Co. has opened a branch office at 728 Woodward avenue, Detroit, the same location formerly used by the Usburne & Whitson Co. as Detroit agents for the Keeton. The new agency is in charge of H. D. W. Mackaye and will take care of the Keeton distribution for all of the Michigan territory.

Milwaukee, Wis.—The Grove Street Garage Co. has been organized by Harry A. Keech, Edmund A. Ringel and Clarence Salentine to conduct a garage and agency. The corporation is capitalized at \$5,000. Mr. Keech formerly operated a large garage on National avenue, near Eleventh avenue, Milwaukee.

St. Louis, Mo.—The action of the city to require motor car dealers to secure permits from the municipal assembly to maintain garages and motor car shops has resulted in a suit being filed in the circuit court by thirty-eight concerns to restrain Building Commissioner McKelvey from enforcing the ordinance. The court is asked to declare the ordinance void, on the ground that it is unjust, oppressive and conflicts with the constitution of the United States and that the municipal assembly has no power to pro-

hibit the erection of buildings for business purposes.

Pilot Mound, Man.—The first public garage at Pilot Mound, Man., has been opened by W. O. Mayor.

Morse, Sask.—W. L. Adsit has opened a large garage and repair shop in the Adams and Hirst building, Morse, Sask.

Boston, Mass.—The Metz Co. of Waltham, Mass., has opened a New England branch for the distribution of its cars at 885 Boylston street, Boston.

Seattle, Wash.—The International Motor Co. has appointed T. G. Young manager of its new factory branch in Seattle for the distribution of Mack, Sauer and Hewitt trucks.

Salem, N. H.—John Wingate, for some years identified with the Darry, N. H., garage, has purchased the business of the Salem garage conducted by Carson P. Bennett.

Stoneham, Mass.—Earle H. Chapin, who has a large garage at Stoneham, has leased a large building at Reading, Mass., where he will conduct another garage in conjunction with the Stoneham shop.

Indianapolis, Ind.—An interest in Indianapolis Automobile Clearing House has been purchased by S. K. Eddy and he has been elected secretary of the company. The concern handles only used cars.

Buffalo, N. Y.—The announcement is made by W. F. Evans of the McCue Co. of Buffalo that Roger B. McMullen, with offices in Chicago and Detroit, has been made general distributor for the McCue wire wheels and axles.

Columbus, O.—C. L. Thayer, formerly foreman for F. E. Avery and later for W. E. Evans, has opened a repair shop at 174 South Wall street, Columbus, Ohio. He will specialize in repair work of electric cars.

Baltimore, Md.—The Cole Sales Co. has changed its name to the Poehlmann Automobile Co. The company will continue to handle the Cole, Stoddard-Dayton and Chandler cars.

Toledo, O.—Woodward & Son of Toledo, a company located in the Nicholas building and dealing in accessories, has filed a request with the secretary of state that they be permitted to change the name of the concern to the Woodward & Son Co.

New York—The Maxim Tricar Mfg. Corp. closed with the British Motor Depot at Copenhagen for its agency in Denmark; with the New York Garage (L. Bousquet et Cie.) for the agency in France, and with A. C. Vanderpool of 18 Broadway, formerly with the Ford Motor Car Co., for the management of its export trade.

Birmingham, Ala.—A contract has been let in Birmingham for the construction of a \$10,000 garage by Kohn Bros. & Cohen. The new structure is to be completed September 15. It is on motor row, between Lawrence and McDonough streets.

St. Louis—The local agency of the International Motor Co. will be conducted in the future by the Saurer Motor Co., a subsidiary of the International company—making the agency a direct factory branch. The Mack Motor Truck Co. formerly was the agent.

Indianapolis, Ind.—The appointment of W. P. Sparks as special representative in Indiana for the Hudson Motor Car Co., has been announced. Sparks, until recently, has been identified with the Archey-Atkins Co., which has the agency in Indianapolis for the Hudson.

Portland, Ore.—A recent Portland consolidation is that of the H. L. Mann Motor Car Co. and the Nob Hill Garage and Auto Co. The concern will hereafter be known as the Nob Hill Garage and Auto Co. By this consolidation the Stutz, Henderson and American agencies are brought under one

roof. The company will occupy the building at 690 Kearney street.

Edmonton, Alta.—The Imperial Garage and Automobile Co. has opened a large garage at 124 Rice street, Edmonton.

Columbus, O.—The Pharis Tire and Rubber Co., 121 East Gay street, Columbus, has taken the central Ohio agency for Acme tires.

Worcester, Mass.—The King Motor Car Co. of Detroit has opened a branch for the sale of its product in the Graphic Arts building on Foster street, Worcester, Mass.

Boston, Mass.—Edward C. Scheu, for several years in charge of the New England district for the Invader Oil Co., has been made manager of the New York district.

Boston, Mass.—Charles E. Lyons, doing a motor business at 721 Norfolk street, Boston, Mass., has just been petitioned into insolvency. He has liabilities of \$2268 and assets of \$200.

Saginaw, Mich.—Because of its rapidly increasing business the Garber-Collins-Buick Co. of Saginaw, Mich., has leased the building formerly occupied by the Olds Motor Works at 318 South Baum street, to which it will

remove its offices and sales force. It will continue business at its present location, 209 South Second street.

Detroit, Mich.—George E. Goble & Co. has opened an office at 680 Woodward avenue, and is acting as manufacturers' agent for tires, rubber matting and wire wheels. The firms represented are the Lee Tire and Rubber Co., the Universal Welding Co., the Axle Equipment Co. and the Victor Rubber Co.

Detroit, Mich.—For the purpose of putting on the market the Green's top lifter, a new Detroit product, the Simplex Specialties Co. has been organized. Offices have been opened in connection with a garage at 703 Woodward avenue, under the direction of John V. Tedford. A general accessory supply business also will be carried on.

New York—Harry M. Bronner, formerly manager of the Stoddard-Dayton Co. in New York, and later connected with the Edwards Motor Car Co., has tendered his resignation as an officer and member of the Automobile Dealers' Association for the reason that he has severed his connection with the motor industry. Mr. Bronner has decided to go back to his old business, that of selling Cliequot.

The Motorists' Bookman

IN "The Care and Operation of Automobiles," one of the most recent of the series of handbooks produced by the American School of Correspondence, Chicago, the author, Horris A. Hall, has put his best foot foremost in the opening section of thirty-two pages devoted to private garages. This portion of the 140-page volume outlines the selection, construction and equipment of different types of garages for the private owner and itemizes estimates for the cost of some of them. The section on the selection of equipment for the owner who wishes to do his own repairing is particularly good. This is followed by a section on driving the motor car which will be found to contain hints of real value even to the experienced motorist. This handbook is listed at \$1.

The Motor Manual

From the Temple Press, Ltd., London, comes the sixteenth edition of the Motor Manual, a book of 266 pages compiled by the staff of the English Motor. The book opens with a chapter on the general principles of operation of the gas engine and in the same chapter takes up the different parts of the motor, their construction and action. Some of the illustrations are indeed simple, while others may seem a bit complex to the beginner, but of great value to one familiar with the gas engine.

The different types of poppet and non-poppet engines are discussed and their working parts well illustrated. A very valuable chapter and one which many owners will delight in reading, is headed "Ignition Systems." The text leading up to the operation of the magneto is simple, instructive and well worked out. Very useful data is given on engine timing, wheel alignment, locating knocks, etc. A number of pages are set aside to explain technical terms, give various tables and also the

methods employed in testing engines and the complete chassis.

In all the book should be found exceedingly interesting to the owner and much more so to the prospective owner, while the motor enthusiast, who does not own a car, will find after reading the publication that he has amassed much information. The book sells for 37 cents net in England.

Bevel Gear Tables

A very handy book for designers and others whose work necessitates the figuring of bevel gears is to be found in Engstrom's "Bevel Gear Tables," published by the Norman W. Henley Publishing Co., New York, and sold for \$1. The author, in compiling the book, had in mind those men who have not studied trigonometry, so that by using the tables printed the figuring will be eliminated. A short table on tooth elements for diametrical pitches is given, followed by one for circular pitches. The greater part of the book is taken up with the gear table which gives the outside diameter, placing distance, and outside cone radius in inches for a gear with a given number of teeth, also the face angle, edge angle, cutting angle and number of cutter for these gears. The angles are given in degrees and minutes, which is far enough for ordinary work.

Motoring in Southern England

A little booklet on "Road Touring in Southern England," by Reginald Wellbye, intended to cover the country south of the Bath Road, is done in a way quite its own, but, being written largely in the negative, leaves rather a drab picture of the country traversed and not an especially enthusiastic desire to motor through many of the sections described. It contains several sketch maps and may be obtained at the price of 36 cents. Published by E. J. Larby, London, Eng.

The Motor Car Repair Shop

IN Fig 1 is shown a means of compressing a coil spring and binding it in a compressed position until assembled into its place on the motor car. The method consists simply in using the vise to compress the spring and hold it so, until bound with wire or string as indicated. In the absence of a vise, one may compress a spring by stepping on it, after having first slipped the binding wires into place; or one man may compress the spring between the palms of his hands while another secures the binding wires.

This is not a new trick, but there are a great many repairmen who do not know it, or at least have forgotten it. It is so useful, however, in many instances that it is worth a reminder. Just a few days ago the writer happened to be in a shop where an effort was being made to assemble the transmission brake operating mechanism of a German Daimler car. The brake occupied a position which was quite inaccessible, and owing to the stiffness of the spring used to keep the brake shoes apart, considerable difficulty was being experienced. This was evident from the mutterings of the workman, who went into a rage every time the spring slipped out of place and dropped, with its retaining washers, down into the greasy pan below the car.

After witnessing several vain attempts, the writer took the spring, which had been shot out onto the floor, and compressed and bound it as shown in the lower portion of Fig. 1, the distance A representing the normal length of the spring. Returning it to the workman, he finally succeeded in completing the assembly without further difficulty. After the assembly was completed, the binding wires were removed with a pair of pliers.

Much trouble can be obviated in this way whenever it is necessary to replace a set of valve springs, particularly if the construction of the motor is such as to discourage the use of the ordinary types

Compressing Coil Springs

of valve spring lifters. The operation of replacing a set of stiff exhaust-valve springs often is a laborious one requiring much time and several bruised fingers, that is, when performed with unsuitable equipment; in such cases a great saving in time and labor and skin may be effected by previously binding the entire set of valve springs with cord or wire as indicated.

One should be careful, however, not to compress the springs so far as to weaken them. One repair shop avoids errors of this sort and also saves its workmen considerable time otherwise required to look for string or wire, to say nothing of the cost of the wire, by furnishing several sets of clips, such as are shown at B, Fig. 1. Two or three of these clips, made from sheet metal about $\frac{1}{8}$ inch thick, will serve to hold a spring in compression very nicely until assembled into place, and they are more readily removed than wire or cord.

Repairing Cups and Cones

When a cup-and-cone ball bearing has been in service for a reasonable length of time, it often will be found that grooves have been worn into the bearing surfaces of both the cups and cones, as shown at G in Fig. 2. If these grooves are allowed to wear too deep the case-hardened crust is broken through and both the cups and cones and the balls as well are apt to go to pieces very quickly, and perhaps give considerable trouble to the passengers on the road. In such cases the cups and cones are beyond repair, and an entire new set is required.

To avoid trouble of this nature, and also to get the utmost service out of its cars, a certain large taxicab company makes a practice of repairing worn cups and cones before their hardened crusts are broken. This is done by removing the cups and cones before the grooves become too deep, then annealing, machining up the bearing surfaces, rehardening, grinding, and reassembling with a slightly larger set of balls.

The annealing is done by heating the cups and cones to a uniform light cherry red heat in a gas furnace, and then smothering them in powdered lime until cold. The hardening process consists either in packing the cups and cones in a suitable hardening compound and then heating, or in simply heating them to a cherry red and then plunging them into a bath of fish oil.

The details of a case-hardening process depend entirely upon the nature of the steel in the parts to be hardened, and the depth and degree of hardness desired.

These details are all carefully worked out by the manufacturer so that whenever in doubt the repairman should either consult the maker or send the parts to him to be treated.

In the repair shops of agents and dealers, where the repair of certain parts is required repeatedly, the methods of heat-treating various parts of the car can and should be known; for there are many emergencies in which the delay brought about by sending to the factory for repairs that might be made at a nearer place is most undesirable. The business success of a motor car dealer often is greatly influenced by the speed and alacrity with which substantial repairs can be made on customers' cars in the repair shop of the service station.

Putting on Nuts

If a nut goes on with difficulty because it is too small, it might be advisable to have the thread slightly chased, trimmed or enlarged by screwing the proper sized tap through the nut. Nuts that fit too tightly have been split in halves either in application or later in service; so one should not use too much force in screwing up a nut. Another cause of trouble which is most detrimental to the threads is brought about when an effort is made to fit a nut with a fine thread to a spindle having a coarser thread, and vice versa, the hole in the nuts being of the same diameter as that of the spindle.

One must always bear in mind that the object of mechanics and mechanical tools is to make hard work easy; and when a job does not go as easily and smoothly as one may reasonably expect, one should not be too hasty; it generally is better to take things a little more slowly—use more brain and less brawn—as the saying goes. A thoughtless workman can do more damage with a hammer and a monkey wrench in one minute than a shopful of skilled workmen can rectify in an hour.

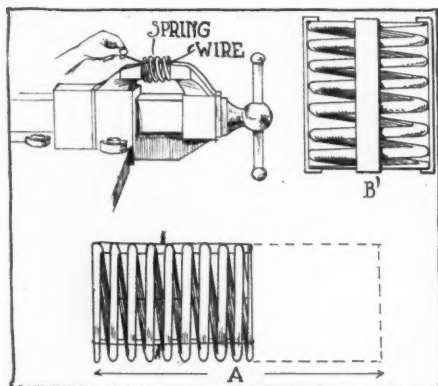


FIG. 1—COMPRESSING A COIL SPRING BY MEANS OF A VISE

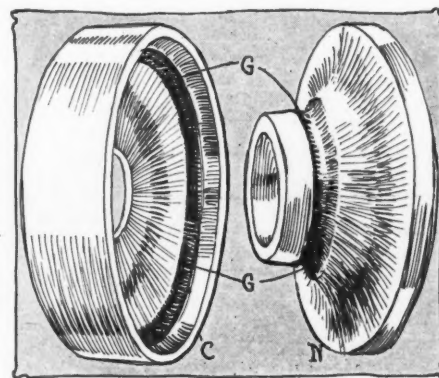
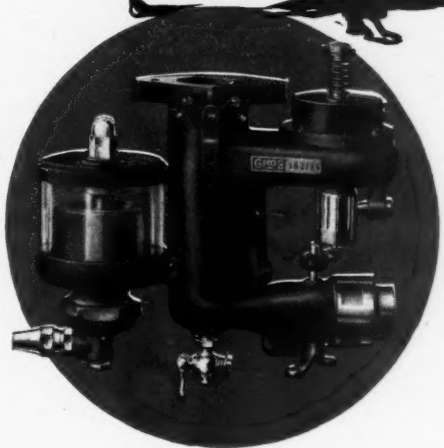
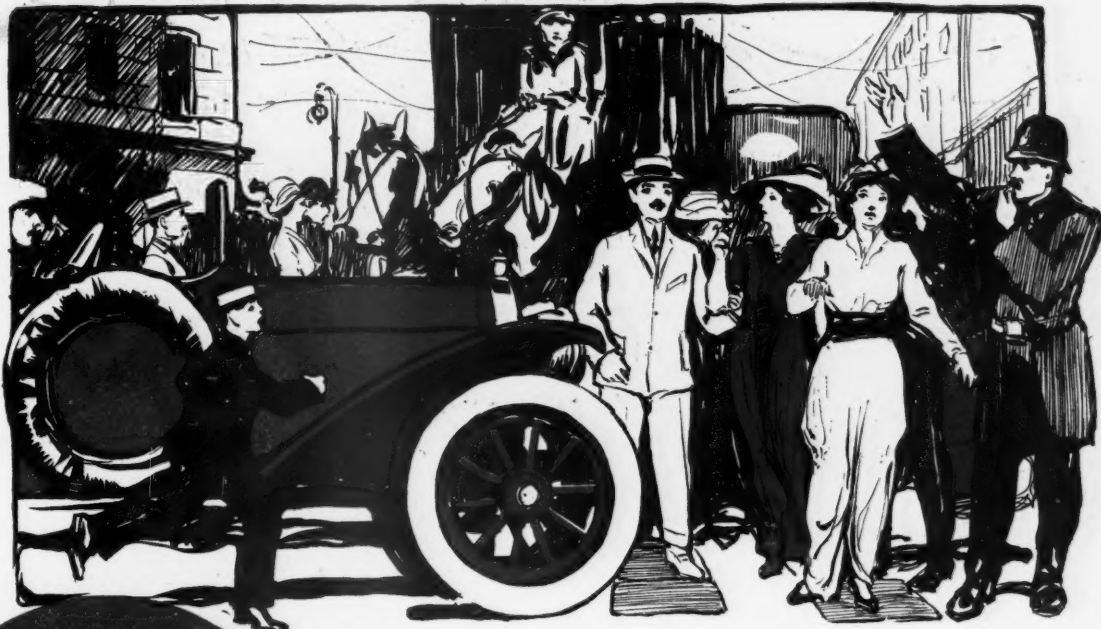


FIG. 2—REPAIRING A WORN CUP AND CONE BEARING

Crowded Traffic Crawl



A CARBURETOR, all else being equal, that **won't** deliver the "crowded traffic crawl" on **high**, puts a nerve-racking strain on the driver, as well as a nagging strain on the car and all its parts. The driver's attention is divided with shifting gears and dodging trolleys. He cannot be on the alert to avoid accidents. Racing his motor on low makes for a decrease in engine life and efficiency. Fuel is wasted.

The city driver by eternally shifting his gears tends to wear them out. If he doesn't shift in time he needlessly jolts the car from bumper to tail-lights. This treatment has been aptly named "the repairman's delight." Add to this, unnecessary wear on the clutch, and you have a partial list of things a carburetor can do to a car.

STROMBERG CARBURETORS

HOW many times have you heard motorists boast, "I can drive my car at a snail's pace on high." You, of course, replied, "It's a good car." You praised the car when you should have praised the carburetor. All of which goes to show that few motorists realize the tremendous importance of that little bronze instrument of carburetion, not much larger than a man's hand, which in many respects makes a car "good" or "poor."

If we told you that a STROMBERG Carburetor would do none of these things you might not believe us. Be your own judge. Take your car to our nearest Service Station and have an Improved 1914 STROMBERG put on. Try it out for 30 days any way you will. If it doesn't do all we claim for it, your old carburetor will be put back—and the trial will have cost you nothing. You can't lose.

Stromberg Motor Devices Co., 54 East 25th St., Chicago, Ill.

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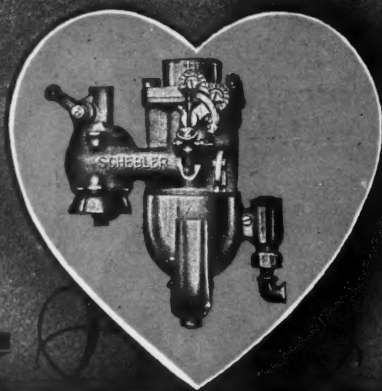
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SCHIEBLER

*The Aristocrat
of Carburetors*



"The Heart of the Automobile"

WHEELER & SCHIEBLER

"Pioneers in Perfection" of Carburetion

MANUFACTURERS
INDIANAPOLIS U.S.A.

THE SCHIEBLER IS THE ACKNOWLEDGED STANDARD CARBURETOR OF THE WORLD

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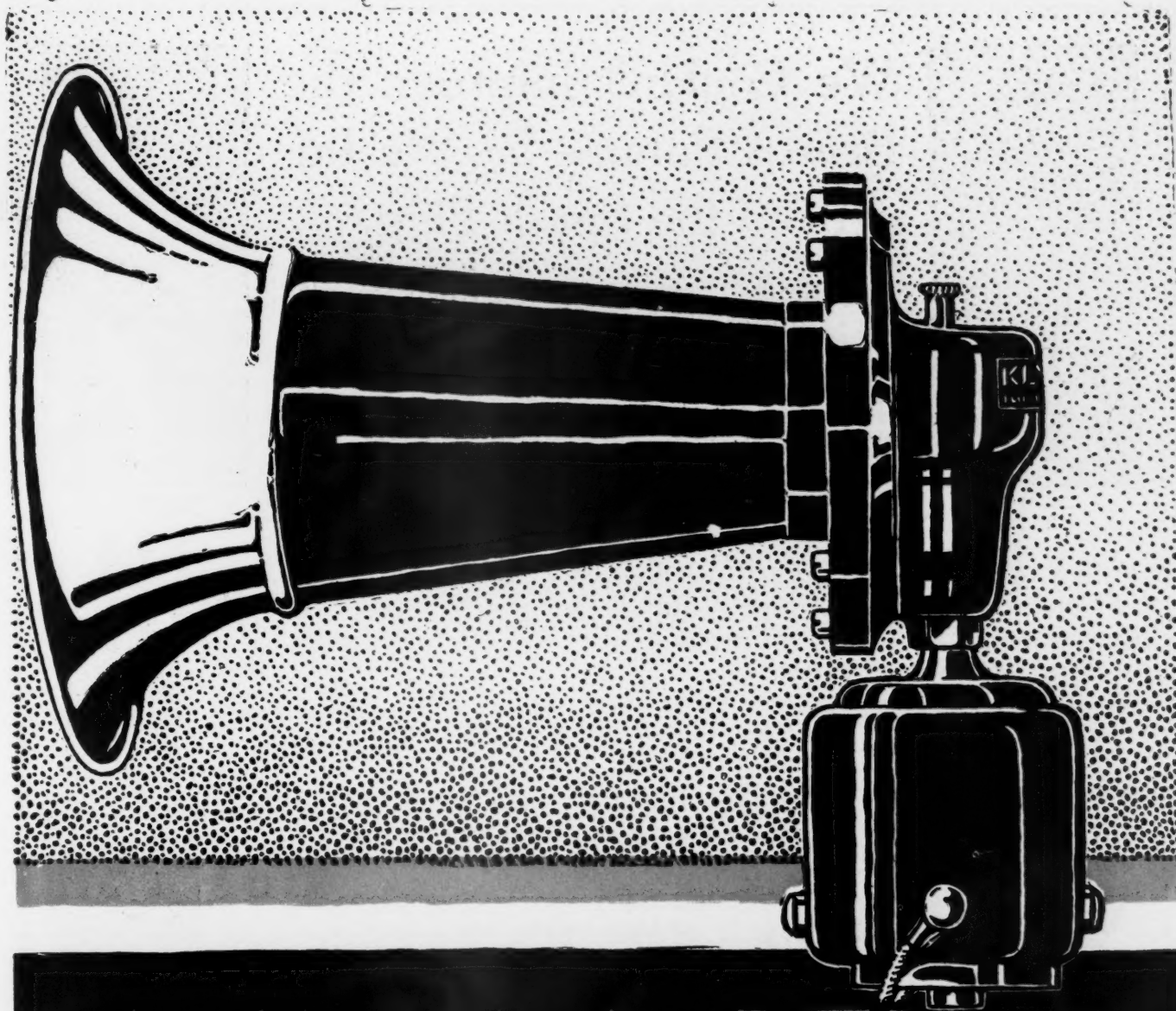
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Every city and town in
the United States and
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KLAXON

"The Public Safety Signal"

The Klaxon fulfills unfailingly every requirement needed in a warning signal. . . . It is guaranteed to do this—permanently

LOVELL-McCONNELL MFG. COMPANY, NEWARK, N. J.



The New Way

We Couldn't Improve the Brown Pump—So We Improved the Spark Plug.

Everybody knows that the Brown Impulse Tire Pump saves time, temper and tires. That it inflates your tires to *exactly* the right pressure in from one to four minutes.

That it is indestructible and very simple in operation. That it has only one moving part—no gears or cams to get out of order.

Everybody knows that the Brown is the only tire pump with self-opening valve connection and high-grade recording gauge as part of its regular equipment. That it pumps nothing but pure, cool air.

But—

It is a nuisance to remove the ordinary Spark Plug. It requires a wrench—sometimes a lot of strength—frequently a broken spark plug.



The Spark Plug

THE NEW B'CO. Q. D. SPARK PLUG

Requires no wrench. A twist of the wrist and the core lifts out—another twist and the pump is in.

Your two hands do the trick in a jiffy.

This new Spark Plug has ample priming space, wonderful lasting qualities, and is the **only** plug that can be removed for cleaning without the use of a wrench.

We give one **FREE** with every Brown Pump.

Price of Pump, complete with Plug.....	\$15.00
Extra Spark Plugs, each.....	1.50
Previous models of the Brown Impulse Tire Pump made to fit this new connection—including Plug.....	2.00



The Old Way



The Pump

Don't strain, fret and fume trying to inflate your tires by hand this year. Don't continue to buy plugs that are constantly getting foul—that need a wrench to insert and remove.

Ask your dealer or write us to-day for full information about the Brown Impulse Tire Pump, and the B'CO. Q. D. Spark Plug

THE BROWN COMPANY, 120 BELLEVUE SYRACUSE, N.Y.



**A Continued
Story—
No. 1**

**Look for
No. 2
Next Week**

Well, you've got to hand it to me
for being the wise guy this time.

Before making my choice of a buzz cart, I looked up the dope on the new-fangled Starters and there's nothing to it.

It's the good old reliable hand crank for mine—always on the job, ready for business. What if it is oily and muddy and I do have to get out in the mud and slush; a gink that runs a machine don't care for good togs anyhow.

Sure, she starts hard sometimes, but exercise is good for me, cooped up in the office all day, and I want a Starter I can depend on.

That agent looked like a good fellow and showed he knew his business when he stood up for the hand crank. It has delivered the goods for years and it's only a question of time when the chaps with the new ideas will be glad to come back to it again.



Storage Battery

Write us for full information.

WILLARD STORAGE BATTERY CO., Cleveland, Ohio

New York Branch: 136 W. 52nd St.
Detroit Branch: 1191 Woodward Ave.

Chicago Branch: 2241 Michigan Ave.
San Francisco Branch: 243 Monadnock Bldg.

Indianapolis Branch: 438 and 439 Indiana Pythian Bldg.

Depots in all Principal Cities in the United States and Canada.

KOEHLER COMMERCIAL CAR

CARRYING CAPACITY 1600 ^{LBS.} PRICE \$750.

Compare The Koehler With Any Light Commercial Car

Examine the two point by point. It will soon be apparent that the KOEHLER is a remarkable value. It has been designed by America's leading commercial car expert. It is built in a well organized and efficient plant of its own. The material used is the best that can be obtained. And its proven low cost of upkeep insures real economy.

The Keynote of Koehler Design Is Simplicity

A glance at the chassis astonishes one by the lack of superfluous parts. Not that anything has been omitted, but that thoughtful design has eliminated parts heretofore considered indispensable. The car is practically fool-proof and can be successfully operated by a novice.

SPECIFICATIONS:

Motor—24 H. P., two-cylinder, water-cooled; Carburetor, Model L Schebler.

Lubrication—Positive mechanical and integral.

Ignition—High-tension Bosch Magneto; no batteries or coils.

Transmission—Planetary; all gears genuine chrome-nickel steel which, together with bevel drive and differential gears, run in constant oil bath.

Wheels—36-inch front and rear.

Tires—2½-inch, solid, fitted on demountable rims.

Wheelbase—90 inches.

Tread—58 inches.



Will Carry a Load 400 Lbs. Less Than a Ton and the Price Is Only \$750

Large and roomy. Inside measurements: 44 inches wide, 84 inches back of driver's seat to rear. Flare-boards, 17 inches above floor. Strongly ironed throughout, also ironed to receive four-post canvas top, which can be had from stock at \$40 additional.

Various types of bodies are obtainable. The Panel Type B is an unusually handsome job. Price, \$150 extra. Inside measurements: 42 inches wide, 53 inches from floor to top, 84 inches back of driver's seat to rear. Canvas side body similar in appearance to Panel Type B—\$50 extra.

Dealers will do well to investigate. The KOEHLER is real value.

Address all correspondence to

H. J. KOEHLER S. G. CO., 1709 Broadway, New York, N. Y.



**NO MOVING PARTS
ONLY ONE ADJUSTMENT**

Over 215,000 Holley Carburetors Will Be Made and Shipped This Year

Over half the gasoline motor cars manufactured in the United States will be equipped with the new self-adjusting Holley carburetor—the new carburetor that engineers are talking about.

It has taken the automobile world by storm.

Two years ahead of its time in design—it is so revolutionary that it makes all other carburetors old-fashioned and out of date.

Entirely eliminates springs, delicate valves, balls, cams and all other sensitive devices which are hard to adjust and get out of order easily.

Equipped with a Holley, the saving in gasoline alone will pay for it in a few months.

1914 demonstration outfits ready. Let us have your specifications early.

HOLLEY BROTHERS CO., 131-141 Rowena St., Detroit

AUTOMOBILE SUPPLY COMPANY...1335 Michigan Boulevard, Chicago, Ill. OMAHA RUBBER COMPANY.....Omaha, Neb.
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Holley Carburetors are carried in stock at the following addresses: CHAS. E. MILLER, Home Office: 97-103 Reade St. and 121 Chambers St., New York

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Between 54th and 55th Sts.
New York City.....2782 Broadway
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Hartford, Conn.....274 Trumbull St.
Atlanta, Ga.....66 Edgewood Ave.
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Detroit, Mich.....227-229 Jefferson Ave.
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New Orleans, La.....601-603 Baronne St.
Newark, N. J.....274 Halsey St.

When Writing to Advertisers, Please Mention Motor Age.

MCCUE WIRE WHEELS



ONLY one tire burst in 570 mile race. Boillot, winning the French Grand Prix on a wire wheel Peugeot, blew out but one tire in the entire 570 miles. Towards the end of the race while making a stop for fuel he changed one other as a matter of precaution. The Excelsior cars, two of them, ran the entire 570 miles without making one single tire change. Commenting on the tire situation in this race "The Automobile" says: "There was very little tire trouble in the race. . . . Altogether the tire situation was very satisfactory, for this was the longest road race in the world—570 miles—and all European speed records were broken."

Can you ask for more certain proof of the tire economy feature of wire wheels?

Not a single wooden wheel equipped car competed in this French classic—certain proof of the confidence the world's greatest drivers have in the tire saving ability of wire wheels.

Insist upon wire wheels on your car for the reason that wire wheels

- Increase tire mileage about 50 per cent.
- Safeguard your life in case of accident.
- Increase your car life.
- Make an easier riding car.
- Make an easier steering car.
- Make a better looking car.
- Increase your mileage per gallon of fuel.

McCue Wire Wheels are equipped with **S**spokes, made by the Standard Company of Torrington, Conn.

THE McCUE COMPANY

Buffalo,

- - - - -

New York

Removal Notice

To meet the tremendous increase which there has been in the demand for MULTIBESTOS BRAKE LINING, STANDARD WOVEN BELTING and SOLID MULTIPLE HOSE FABRICS a new factory has been built and equipped for the manufacture of these products on a much larger scale.

This has made necessary the abandonment of our old plant at Worcester where we have done business for many years, but where facilities were proving more and more inadequate to meet the growth and expansion of our business.

In the new factory at Framingham will be found every modern feature tending to promote quality and economy of production, not only of our present lines but of extensions which embrace everything in the way of woven fabrics for mechanical purposes.

Under such ideal conditions for doing business we can ask a continuance of orders from old customers and an investigation from new prospects with the full confidence that we can serve them to their profit and entire satisfaction.

Framingham, Massachusetts
Standard Woven Fabric Company

August First
Nineteen Thirteen

102,695 Cars X \$200.00 Annual Expenditure Twenty Millions for Accessories

The average cost of cars owned by Digest readers is \$2,391.00. We are conservative in allowing less than 10% of the cost price of the car as the annual expense for accessories. A \$600.00 car is figured at \$60.00 per year. A \$5,000.00 car at \$500.00 per year.

The greatest number of accessory manufacturers advertising in any general magazine is 83. Of the total the Literary Digest has 74 separate accounts. Because it is so essential for the accessory advertiser to reach the automobile owner, our value for this class of advertising is universally recognized.

Not only have we the largest circulation that any class publication has ever acquired, but we have it in such recorded shape as to prove that among the 280,000 Digest families there are now 102,695 motor cars owned. There are very few manufacturers who alone could supply the accessory needs of Digest readers.

It is a sensible thing to advocate the use of large space for accessories in The Literary Digest. You can concentrate here and hit hard at small cost. For instance, six double spreads (size 16 x 10) can be bought for \$7,200.

The Literary Digest Circulation belongs to The Literary Digest. This is so because a subscription for The Digest is never entered in combination with any other publication. There are no clubs, no cut rates, and no inducements offered to renewal subscribers other than the contents of the magazine itself.

The Literary Digest

Sometimes the skeptic proves his own worst witness. We were sent for by a manufacturer of accessories and given an order. During the interview the question was asked whether our trade paper advertising was paying, with the added opinion from the questioner that he was doubtful of its value. Inasmuch as we had never called on this house before and as an order resulted, do you not believe that we were right in saying that our advertising in "Automobile" and "Motor Age" is paying? Assuredly here was an order that should be credited to direct traceable returns.



DEALER

1914 ANNOUNCEMENT

To our Present Dealers and any dealer who wishes to embrace the opportunity of handling the 1914 Edwards-Knight Car:

The New 1914 Edwards-Knight Cars are Ready

Beautiful cars in appearance, and wonderfully perfect in all mechanical detail.

The 1914 Edwards-Knight, 4 cylinder car—price\$2800.00

The 1914 Edwards-Knight small Six, 7 passenger car—price\$3200.00

The distinctive features of these cars are proving very attractive to exacting buyers. The Edwards-Knight cars have the celebrated silent Knight engine—the engine of simple parts and perfect performance—if you haven't seen it, it's a mechanical revelation.

The Lanchester Cantilever Springs, and improved method of spring suspension that only needs to be seen to be appreciated—it's the easiest riding spring of all. The silent, smooth worm-gear drive—four speed transmissions and the wire wheels which have been adopted almost exclusively in Europe. They add resiliency to the whole car, and are a saving on tires. The Edwards-Knight 1914 car is hard to resist upon inspection—everything that good engineering skill and ingenuity could devise has been incorporated here. The superiority of the car is so apparent it practically sells on sight. Back of it is the identical organization that made the famous old Stoddard-Dayton car such a success.

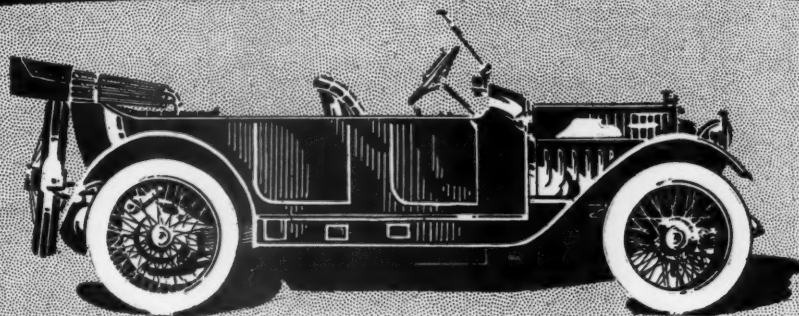
We will be glad to hear from dealers in all sections of the country. We can make immediate delivery. Models on exhibition at our offices. Kindly write us for detailed information.

THE EDWARDS MOTOR CAR COMPANY

U. S. Rubber Building

Broadway at 58th Street

New York City



Ordinary Springs Won't Do



Don't risk them on future cars. Steel experts have discovered a better process of steel-making—a process that banishes all possibility of flaws and irregularities. It is called the "cross-roll" method.

In the ordinary process of rolling, the steel is simply rolled longitudinally. All the "pipes" and "blow-holes" are rolled into the bar. Such steel is bound to be unreliable, to develop hidden weaknesses. It is the cause of 80 per cent of broken springs.

The Steel we use in Cleveland-Canton "Chrome-Vanadium" Springs is made by the "cross-rolled" method. The material is first worked longitudinally, then transversely. It tests as strong in the cross-section as longitudinally. It is amazingly strong, uniform, homogeneous, tough.

Cross-Rolled Chrome-Vanadium

"Not a
Bump in
One of
Them"



"Built for
Life-Long
Endurance"

Such springs mean utmost safety to the car. Such springs withstand terrific shocks, sudden strains. They have astonishing resiliency, yet immense strength.

They are the strongest, toughest springs made.

Your car, equipped with Cleveland-Canton Chrome-Vanadium Springs, gains greater prestige, is easier to sell. *In five years not one Cleveland-Canton Chrome-Vanadium Spring returned because of breakage or settling.* Send us your blueprints and let us quote prices.

Best Grade — Chrome-Vanadium
Next Best — Special Analysis

The Cleveland-Canton Spring Co.
Canton, Ohio, U. S. A.



WARNER

QUALITY AUTO-METER

1,000 Miles a Minute

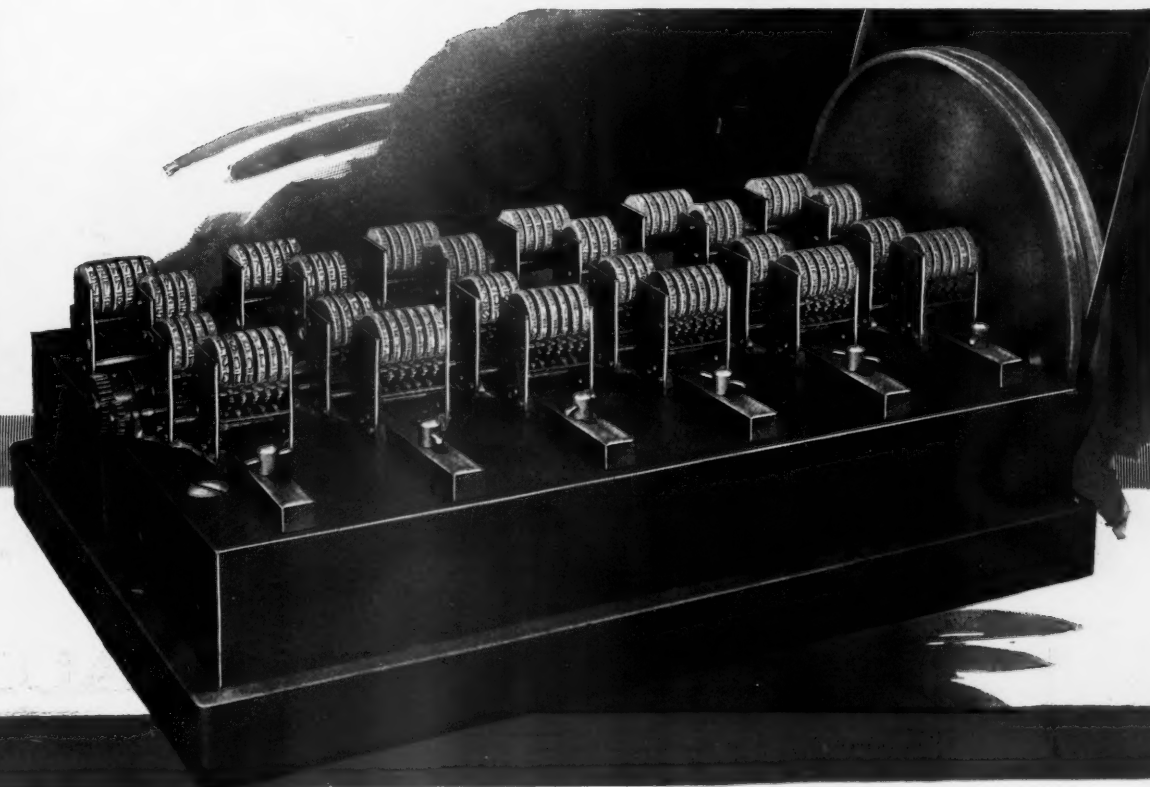
THE odometer of every Warner Auto-Meter made is tested, on the machine shown below, at 1,000 miles per minute—one thousand times as fast as it is ever likely to be called on to run, and five hundred and fifty-eight times as fast as any automobile has ever been driven. It must show absolute accuracy in hours of running at this speed, or it is thrown in the scrap heap. The world's fastest motor car record is 106 miles 382 yards in one hour, recently made at Brooklands, England. The Warner odometer is tested at a speed five hundred and fifty-eight times as great.

In ordinary motoring a speedometer is very rarely required to record a speed as high as 60 miles per hour—because at this speed the pleasure of motoring is lost. A speedometer which registers correctly at a mile-a-minute speed can, therefore, be relied on as accurate. We prove the Warner absolutely accurate at a speed one thousand times as great.

No other speedometer made is given the severe tests and careful inspections to which the Warner Auto-Meter is subjected.

If you knew more about the fine interior construction of the Warner you would better understand why the vast majority of high-priced cars are Warner-equipped.

The Warner Auto-Meter Factory
Beloit, Wisconsin



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Main Office, 79 Broad

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Cleanest

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LEE HARDWARE CO. Salina, Kan.
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Kansas City, Mo.
JAMES BAILEY COMPANY Portland, Me.



When Writing to Advertisers, Please Mention Motor Age.



*This monogram stands
for all you can ask
in a motor car*

You Can Buy

an automobile for less than the Chalmers price, but you cannot get Chalmers features and quality in that automobile

We mean that. And we can prove it. For any less price than the Chalmers price you can't get, for instance, a motor of equal quality. Big and sturdy, quiet but powerful, this motor delivers to the driving wheels its full rated horse power—day in, day out, summer and winter. It hangs on.

You can't get, for less than the Chalmers price a four forward-speed transmission and all ground gears. Four forward speeds mean utmost flexibility. All ground gears mean freedom from noise, friction, wear. Insist on a four forward-speed transmission. Once you have used this wonderful improvement you will never be satisfied to drive a three-speed car.

For less money, than the Chalmers price, you can't equal the conveniences of the Chalmers—such conveniences, for example, as Chalmers reliable self-starter; electric lighting system; demountable rims; carburetor dash adjustment.

Comfort equal to that of the Chalmers you can't possibly secure for less than the Chalmers price. In fact, we doubt if you can get the same complete restfulness in any car—at even higher prices. Luxurious cushions and upholstery; long wheel base;

big wheels and tires; long, flexible springs—make Chalmers riding a delight.

Beauty, style, elegance—no car at any price **surpasses** the Chalmers in these qualities. Certainly you cannot **equal** the Chalmers in these respects for less than the Chalmers price.

Chalmers quality is inbuilt in Chalmers cars—the result of Chalmers manufacturing methods. Chalmers cars are **manufactured** cars. They are built in our own shops by Chalmers men, under the most rigorous Chalmers inspection (one inspector to every 13 workmen). No car at **any** price contains better material, none more careful, painstaking workmanship.

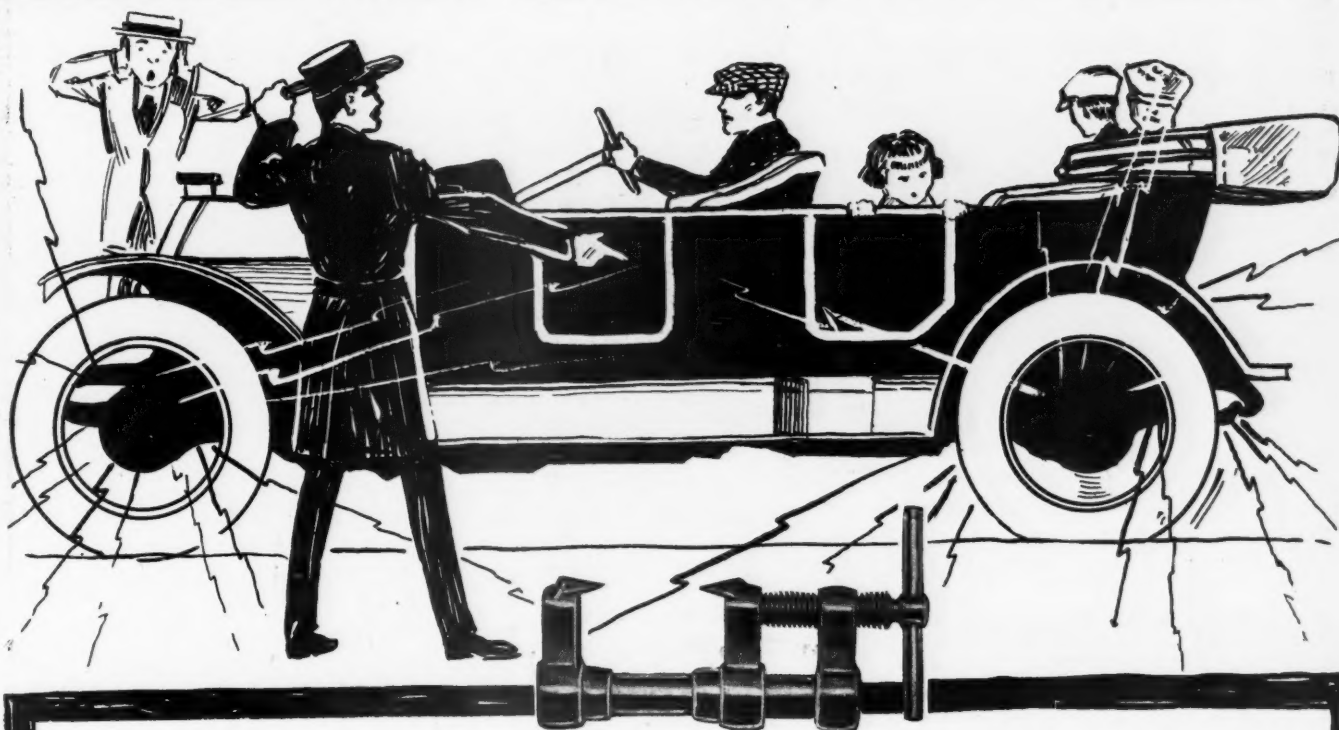
For **less** than the Chalmers price you inevitably get less than the Chalmers quality.

It pays to buy a quality car at the start. It pays to buy a Chalmers car—a quality car at a medium price.

Don't try to "save" money at the cost of permanent satisfaction.

See the Chalmers cars at our dealer's and let him tell you more about the Chalmers quality cars.

Chalmers Motor Company, Detroit, Mich.



Stop the Squeaking of Those Springs!

You Can Do It Quickly and Easily With

KNOWLSON'S SPRING LEAF SPREADER

You *know* as well as we do that lubricating the leaves of your springs is as necessary as lubricating the axles. Until now you have had to spread the leaves of your springs with the cold chisel and hammer—a method that is extremely troublesome and unhandy as well as damaging to the springs. Because of the amount of labor required to lubricate the springs by the old method, you have probably many times neglected this necessary piece of work. Now you can lubricate the spring leaves easily and quickly—at a saving of time and energy.

By lubricating the springs of your car regularly you not only get longer life out of them, but you get from fifty to one hundred per cent more resiliency. Your car rides easier and quieter. There is more comfort, more pleasure and less expense for you.

KNOWLSON'S SPRING LEAF SPREADER is the biggest money and time saver you can have in your tool kit. It does away entirely with jacking up the car. You merely adjust it to the springs, turn the handle, and with a jack knife or oil can spread the lubricant on the springs. Made of drop forging, are nickel-plated, highly polished and well finished. The entire tool weighs less than one pound. It is adjustable to any size automobile spring.

You'll find a Knowlson's Spring Leaf Spreader in the tool kit of all the latest Cadillac cars.

**GUARANTEED TO BE ABSOLUTELY SATISFACTORY OR YOUR MONEY BACK.
GET ONE TODAY.**

Price \$1.50

At your dealer's or sent prepaid upon receipt of price.

SPRING LEAF LUBRICATOR COMPANY
1004 Forest Avenue, ANN ARBOR, MICHIGAN

COUPON

M. A.

Spring Leaf
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Company

1004 Forest Ave.,
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Gentlemen:

Enclosed find \$1.50 for one
KNOWLSON'S SPRING LEAF
SPREADER to be sent prepaid.
I can return this if not satisfactory.

Name.....

Address.....

City.....State.....



A PRODUCTION of 50,000 cars for 1914 has made possible an unusually spectacular and unexpected value.

Our announcement next week will be an event. Buy this publication, and get the big facts.

Please address Dept. 46

The Willys-Overland Company
Toledo, Ohio

Sell and Drive a Healthy Car!

A car cannot be healthy with a feeble ignition system to any greater extent than a man can be healthy with a weak nervous system. The nerves of a car are found in its ignition. The difference is that if a car's ignition doesn't give 100% **Service**, you can install a new set of nerves just as fast as a repairman can work.

CAR MANUFACTURERS AND MOTORISTS who have not been experiencing the kind of ignition service that **sells** cars, and makes it a pleasure to drive them, should remember that they can at any time switch over to

KINGSTON

IGNITION SPECIALTIES

Our Service Department will help you in determining your 1914 ignition equipment, and in solving any individual problem in ignition which may have baffled you. Simply write us giving full particulars.

KINGSTON Magnetos contain all the latest improved features of construction. They are made in all types for all requirements—high and low tension currents—light and heavy duty. KINGSTON Ignition Devices also include spark plugs, make-and-break coils, dash coils, box coils, motorcycle coils, switches, and other ignition specialties, every one of which is guaranteed to give perfect service satisfaction.

Write for Catalog

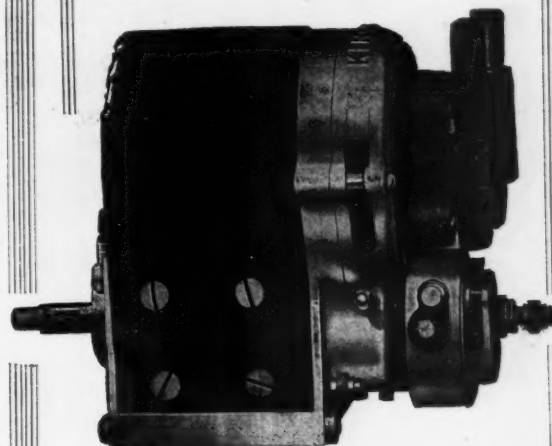
KOKOMO ELECTRIC COMPANY

Kokomo :: :: Indiana

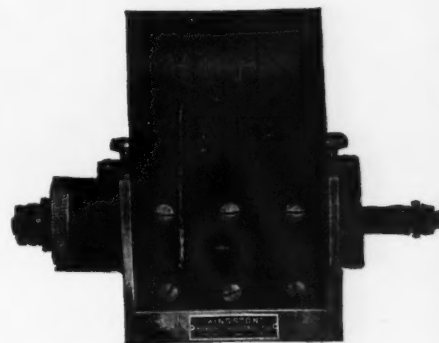
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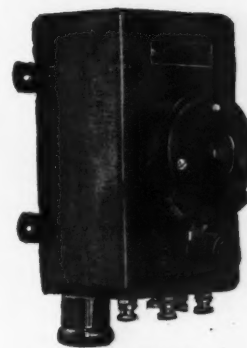
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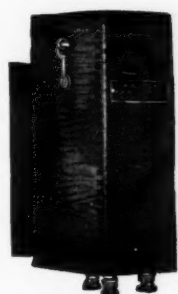
Model "B" Magneto



Model "E" Magneto



Dash Board Transformer



Covered Vibrator Box Coil



A. L. A. M. Standard Plug

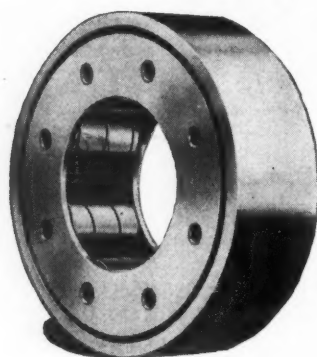


Kingston Switch

When Writing to Advertisers, Please Mention Motor Age.



HYATT QUIET BEARINGS



Hyatt Roller Bearings require no adjustments after the car has left the factory. Once properly installed and given a little lubrication now and then, they will give a care-free service that is unequalled.

The hollow Hyatt Roller retains a large quantity of the lubricant and the spirals, alternating from left to right, constantly distribute it over the surface of the bearing.

Grit and dirt that ordinarily grinds between bearing surfaces, is forced into the hollow center of the Hyatt rollers through the spirals, keeping the bearing exceptionally free from foreign matter.

Flexible Hyatt Rollers cushion the road shock, absorb vibration, reduce noise, and give under strain just enough to relieve the gears and shafts of excessive duty.

HYATT ROLLER BEARING CO.

DETROIT, MICHIGAN

WORKS, NEWARK, NEW JERSEY

When Writing to Advertisers, Please Mention Motor Age.



1914

Maxwell Announcement

This Ad Is To Dealers Direct



DOUBTLESS you have read our 1914 announcement which appeared in all the big daily newspapers East of the Rockies last Sunday, and will appear in all the large newspapers West of there next Sunday.

Just in passing, might mention that this is only the first of a series of big advertising campaigns. This one cost approximately \$30,000, and is just an indication of how we are going to sell the product for our dealers.

That is one of the reasons why 4,000 dealers are going to handle this line—and they will be 4,000 of the best dealers in the United States. The other reason is that the dealer who investigates will find that here is a line he cannot duplicate anywhere else.

You have had experience doubtless with handling lines of cars with various models by the same maker in different priced classes. You know what ordinarily happens. One or two of the models are ready sellers—but there is always one that drags. Always one that the sales manager

tells you you must take if you are to get the others.

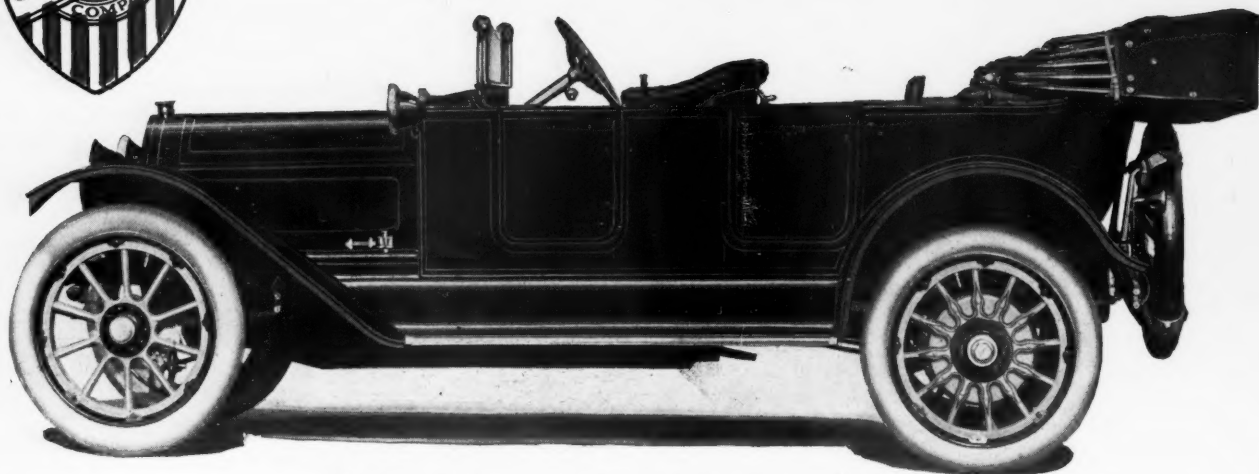
That is what we have in mind when we say that the Maxwell line for 1914 cannot be equaled anywhere else.

Take, for example, the highest priced car in the line—Maxwell "50-6." Ordinarily you would expect the big fellow to be the one that would drag if any did.

We refer you to last season's experience—the season which closed August 1st—and call your attention to the fact that we were the only makers of sixes in this class who had not a car left in his factory on that date.

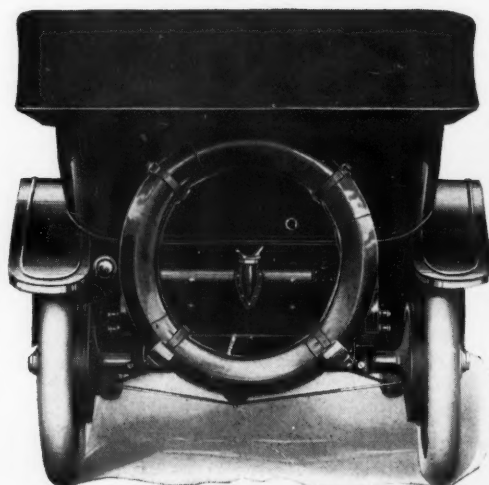
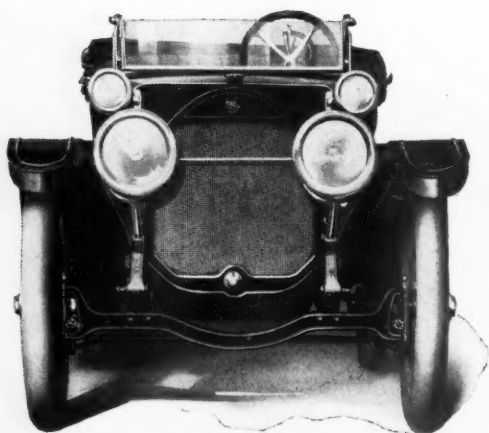
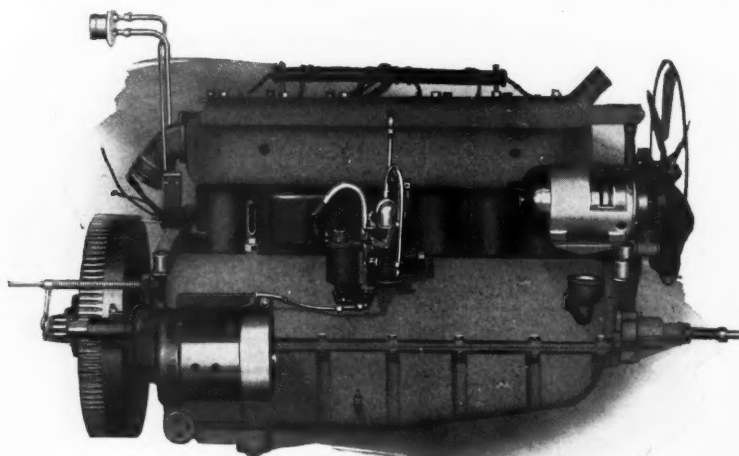
Price last season was \$2350. Without the slightest change—because we did not know how or where to make it better—except to give the buyer his choice of right or left hand steer—we have made the price of the 1914 model \$1975. This, with Gray & Davis Electric starter, full equipment, even to electric cigar lighter in tonneau and finished in every detail so that it puts it up to the maker of a \$4000 car to prove where he gives the difference in quality.

The six is a flexible proposition from a manufacturing standpoint. That is to say,



1914 Maxwell "50-6"—\$1975

The sweetest running thing on wheels. Six cylinder motor, bloc-cast, 50 h. p. 130" wheel base; electric starter and lights; Bruce Ott body; 5-7 passengers; disappearing seats; 36"x4½" tires all 'round. Luxuriously finished, long, easy riding springs and full equipment, including ventilating windshield, top and Jiffy curtains—even an electric cigar lighter. Left or right side drive optional.





we can increase or retard the production of a car of this type, so as to make 2000 or 3000 or 4000 or 5000 or 6000 of them, according as the demand develops.

With the model "25," for example, this would be impossible. It is a quantity production proposition, and if we are going to make 30,000 of them—as is our plan—we must equip for that many and we must make that many in order to make them at the price. You can understand this even if you are not a manufacturer.

As I have said, the six is a flexible proposition. We enjoyed a splendid demand for the 1913 model, at \$2350. We intended to make the price \$2400 for 1914—in fact, we said as much in our ads recently. But you have doubtless noticed there is a red-hot contest on for supremacy in this class of car—it is a rather easy class for smaller manufacturers and assemblers to get into. You have noticed some cut-throat methods of late. It did not touch us because we were sold out.

But looking the situation over, Mr. Flanders said: "We can doubtless sell all the sixes we make at \$2400. But I do not propose that our sales force shall be engaged in forcing any one model. Every car in the line must sell on its own merits and meet its own competition entirely independent of any other car in the line."

"Now, inasmuch as some folks have started something, I am going to give them a car that is known as the sweetest six on wheels, and at a price they cannot surpass and stay in business. We will just make it \$1975, and we will make it just as good as we can—and see how far the others can follow the pace."

So you see the big car—the big seven-passenger fellow—which will naturally command a lesser demand, and which you would expect to be the tardy one, will probably prove to be the leader of the line.

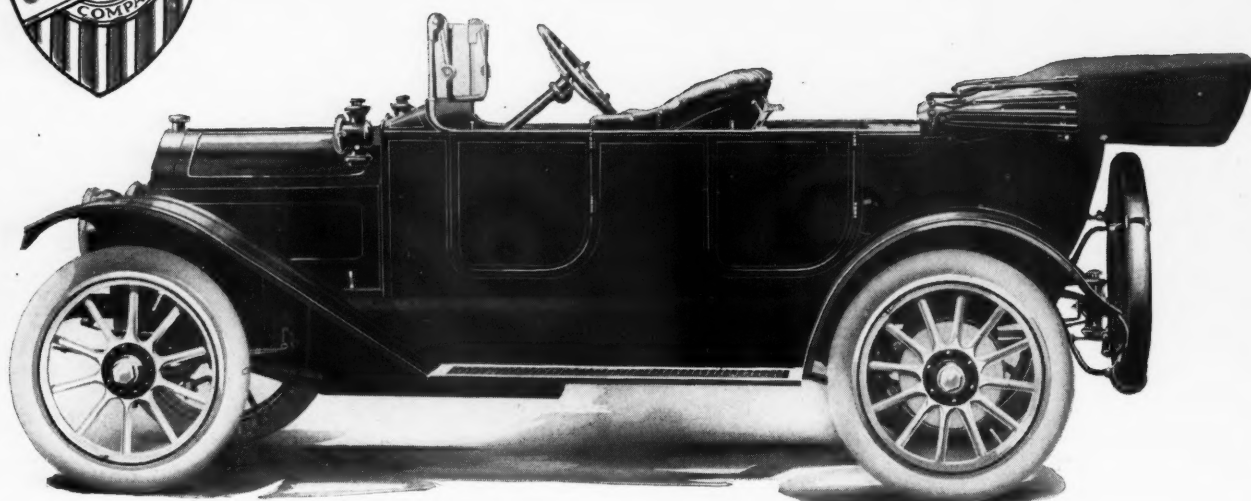
One thing is certain—you as a dealer can appreciate that the big, beautiful six

will give class to the entire Maxwell line. The owner of a Maxwell, no matter of which model, will be proud to say he owns a Maxwell. We are not dealing with verbiage, nor using superlatives unnecessarily, because we are talking to practical men—to dealers who are accustomed to handing out enthusiasm themselves and who naturally discount everything they hear. But we want to say to you that we believe there is no other six-cylinder motor in any car, at any price, that is as well balanced or as sweet running as this six. With the full floating rear axle which we recently put under this car it is a perfect product—or as nearly perfect as engineering skill and manufacturing care can make it.

By the way, you, as the man who has to stand between the factory and the ultimate user, will appreciate this—if you did not know it before: When we found that the axle under the "50-6" was too light to hold the motor—driving pinion not strong enough, and not enough room in the housing to put in a larger one—we replaced without request, and entirely at our own expense, every rear axle under every "50-6" car that was out.

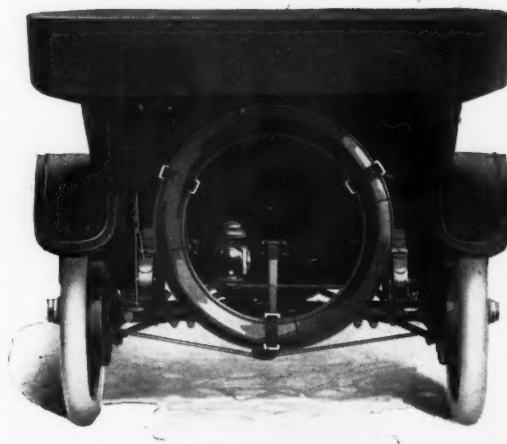
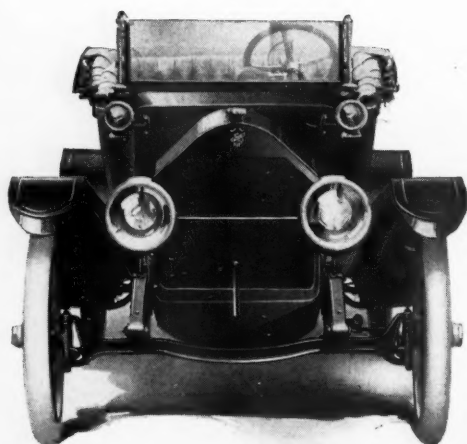
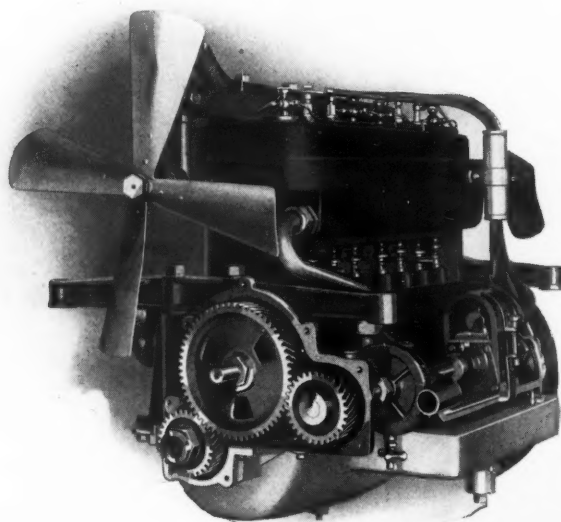
That is a mighty important point for a dealer to consider. It shows what our policy is going to be in the matter of standing back of our product—no matter which one. What we did for the "50-6" we would do for the "35" or "25" if it became necessary.

In short, the 4000 dealers who will handle the Maxwell line for 1914 will know first: That every car in the line will be the leader in its class—will dominate its class because it will be a better car for the same or less money than a buyer can find elsewhere, let him shop until he is black in the face. Second: They will know that the policy back of the \$37,000,000 concern that makes this product is based on the assumption that if we are to stay in business, and become the biggest in the busi-



1914 Maxwell "35-4"—\$1085—\$1225

Powerful, silent, sweet running; bloc-cast 4-cylinder motor; 111" wheel base; 33"x4" tires all 'round. Left hand drive, center control. Electric starter and lights, at \$1225. Three-quarter elliptic springs. Bruce Ott body, ventilating windshield and full equipment, including Jiffy curtains.





ness, we must back up our product to the dealer who passes it on to the buyer.

While we will be second largest in the world this year, that does not satisfy us at all. We have got to be first.

Next consider the Model "35." The same wonderful bloc-cast, four-cylinder motor that was in the Everitt "36"—frankness compels us to admit that there was not much else good in that particular car. But that was not our fault. We did not make it. We acquired that proposition primarily to get two of the greatest motors we have ever known—the "50-6" and the "35-4" motors.

You cannot develop an automobile motor in a day—nor in a year—nor in two years. We have bought that knowledge with hundreds of thousands of dollars and years of experience. So we took these two wonderful motors, and we built a car that was as good all the way through as the motors themselves—the Maxwell "35-4" 1914 model which will sell at \$1085 without, and \$1225 with electric self-starter and lights, cannot be equaled anywhere else at the price.

Oh, yes, we know all about it: There are other cars of similar rating, horsepower, wheel base, and all that sort of thing, but we don't need to tell you, as a practical dealer, where the difference is. You will lift the hood and find it for yourself. If you don't find it all there, you will take a look inside the transmission case. You will find it in the beautiful body, designed by Bruce Ott. Made and trimmed as they do not make and trim bodies in the ordinary \$1200 class. We do not need to tell you the tremendous difference in cost of making a bloc-cast motor, such as this, and one with single or twin-cast cylinders.

We do not need to tell you. You know.

To let you into a little secret, our engineers started some months ago to re-design this motor so as to take \$150 out of the making and bring it down in price so

as to compete with other cars that, looked at superficially, might be considered competitors—cars that, being made cheaper, can afford to be sold cheaper. There was a riot when our dealers heard of this. Our Sales Manager joined in with them and soon became the ring-leader. All protested against the slightest change in this splendid motor. And Mr. Flanders agreed.

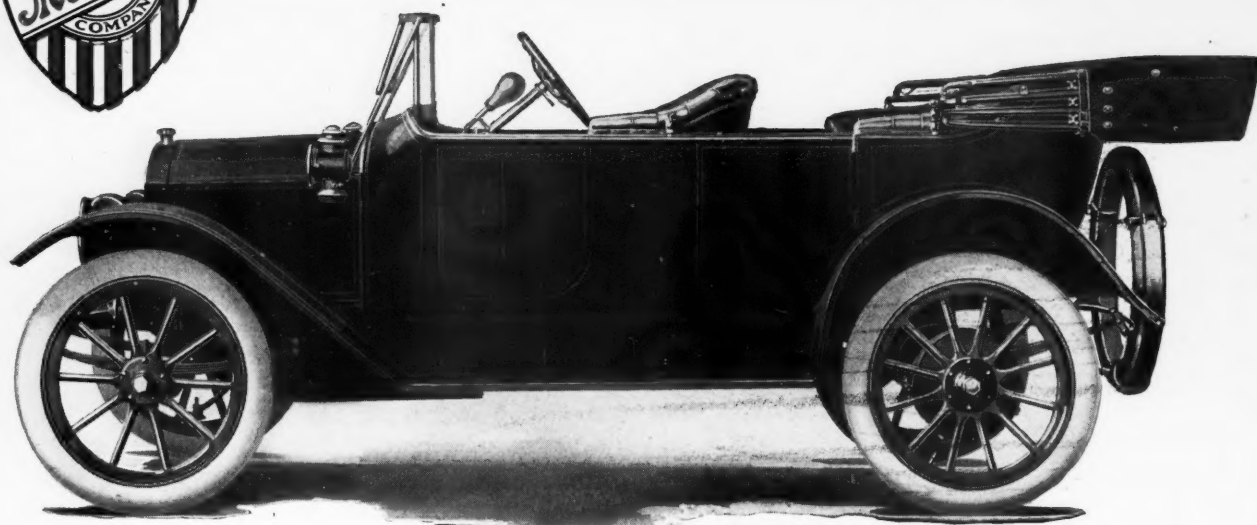
Every man who has handled this car, or sold it, knows that such a motor is vastly more expensive to make—but it's worth it because when it is once made it is made for keeps. There is almost no limit to the life of a well-designed, well-proportioned bloc-cast motor. Being machined as a unit, everything has to be in line—and crank-case and cylinders being cast in a unit, everything has to stay in line. So you see we have another dominating car in our "35" model.

We won't have to ask you to take a few cars of this model in order to get the other—the customer who wants a car in the \$1200 class will, after looking them all over, insist on this one—and you will simply supply his demand.

And now the wonderful Maxwell "25"—the car you have all been looking for, hoping for, and wondering why some big manufacturer did not make.

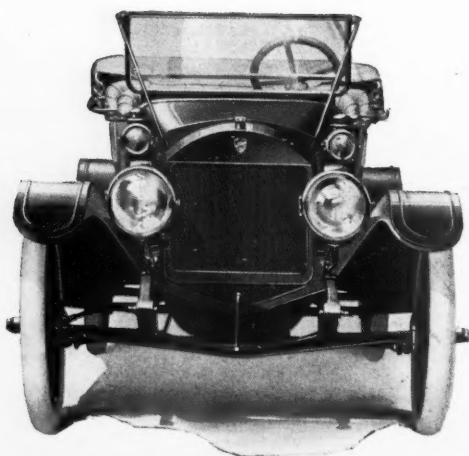
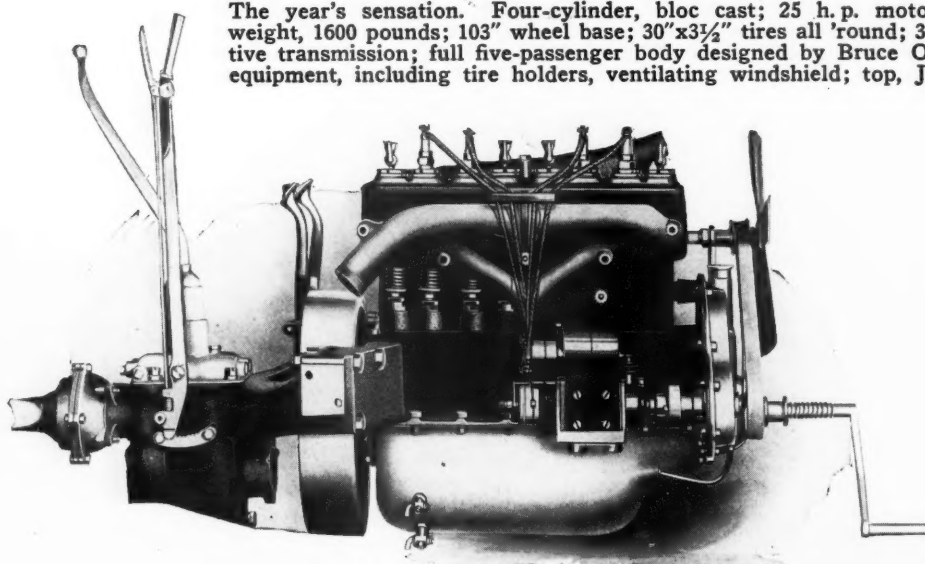
Much as you know about this business, you probably did not know that the first requisite was manufacturing facilities and millions of dollars capital. On top of that, it involves the greatest engineering feat known to the industry.

Why, it's child's play to design a \$5000 automobile. If you doubt it just look back over the past and recall the hundreds of \$5000 cars you have known. They came and went—mostly because the demand for such a car was too little—and you have doubtless noticed it is getting less and less every day.



1914 Maxwell "25-4"—\$750

The year's sensation. Four-cylinder, bloc cast; 25 h.p. motor; magneto; weight, 1600 pounds; 103" wheel base; 30"x3½" tires all 'round; 3 speed selective transmission; full five-passenger body designed by Bruce Ott; complete equipment, including tire holders, ventilating windshield; top, Jiffy curtains.





Cars like the Maxwell "50-6" at \$1975 puts a crimp in that kind of proposition. The maker of a \$5000 car is on the defensive today. It's up to him to prove he has a better car. Most of them have given up trying to prove it—and built a smaller car. But they still try to get a high price for a former reputation. There's going to be some real fireworks along that line during the next few months—just watch the Maxwell "50-6."

But we were talking about the "25." Funny how we will get discussing one of these models and slop over on to one of the others. You see we are very enthusiastic about the whole line—each one is King in its own Principality.

We were saying it was child's play to design a \$5,000 car—do you know that there is only one maker in the world who has ever been able to make a good cheap car?

No, we're not advertising the other fellow—we are just telling the truth.

We did not start out to make that kind of a car. You have told us—thousands of dealers have told us—that there were hundreds of thousands of people who were willing to pay a little more for a car that was a lot better.

A real automobile, in which the people in the tonneau did not have to rest their chin on their knees.

One that a six-foot man could drive himself without having to make a chauffeur of his four-foot-eight son.

It's funny, but seems as if more big men buy more low priced cars than any other price, so we figured that the seats had to be standard size, to fit the buyer. On top of

that it had to have power plus—because you know a car like this is criticised more rigidly than a \$5000 car. To the buyer of a \$5000 car, the deal is an incident in the day's work. To the man who buys a car like the Maxwell "25" at \$750, it is a mighty important matter. He not only must consider first cost, but to a still greater extent, must he consider maintenance cost afterward. "Design for that quality as the first consideration," said President Flanders to our engineers.

Such a car must be light, and it must be strong. It must withstand anything it runs up against. Consequently it must be made of the best materials the science of metallurgy knows how to put into it.

And finally, it has to have style and finish—because you know we are building this car for a class of buyer who, like the average American, detests a uniform and refuses to wear one even if it does cost less than regular clothes. That's the kind of car we have made in the Maxwell "25"—and we won't have to insist on your taking a carload of these in order to get a six or a "35." You will want this car on its own merits too.

Now just a word more: We cannot hope to supply the full demand for any of these models—with the possible exception of the "50-6," which, as we stated above, is a flexible proposition. If the demand runs above 6000 of these, however, we cannot supply them. We are laying out our plants for 500 cars a day of the model "25"—but it will be 18 months before we reach that point.

During the next twelve months we will, however, make 30,000 of the Model "25"; 12,000 of the Model "35" and 2,000, or as many more as you want up to 6,000 of the "50-6." That makes us second largest in the world—but that doesn't satisfy us. We've got to be first. There is only one way to do that—make better cars at the same or lower prices; and—stand back of the product and the dealer. That's the only way we know and, again, we refer you to our policy, not as we speak it but as we proved it in our acts in regard to the Maxwell "50-6."

Such a policy once known gives every dealer confidence and enthusiasm. Well, that is the Maxwell Company's policy.

MAXWELL MOTOR COMPANY, Inc.

Detroit, U. S. A.



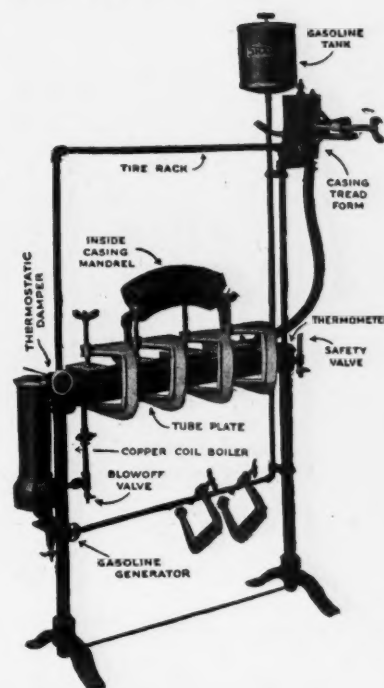
Some views in the Maxwell Laboratory where we analyze, specify and test every piece of material that goes into any Maxwell Car

A Big Money-maker for the Garage

Vulcanizing pays big profits. Unless you're equipped to handle it, you are missing one of the most valuable opportunities connected with the automobile trade.

No experience is necessary. We teach you all you need to know in order to turn out tire repairs that you can guarantee.

Give your customers *complete* service. Don't force them to take their tire work to your competitor.



SHALER Vulcanizing Plant

Will do every kind of vulcanizing that you will want to handle—tube punctures to casing blow-outs. Handles six tubes as quickly as one. Casings are repaired by the approved wrapped tread process adopted by tire manufacturers.

Steam is raised in twenty minutes in a copper coil boiler, so that the machine can profitably be heated up for a single repair. A gallon of gasoline will run the outfit all day long, or gas may be used for fuel.

The temperature control is automatic. No watching or regulating. Simply start the burner and a thermostat keeps the temperature exactly right for vulcanizing.

Other Vulcanizers for Every Requirement

There's a Shaler for every requirement of motorist and garage, from the \$2.00 Vul-Kit for mending tube punctures on the road, to the complete garage plant shown. Electric, steam and alcohol heated models.

Garages:—

Write today for details of this money-making proposition. Get busy before YOUR trade is started into someone else's door.

C. A. Shaler Co., ²³¹ Fourth Street, **Waupun, Wis.**

You need this book

IT IS A PRACTICAL BOOK, Simple as the A B C's, written by A. L. Dyke, publisher of the first practical treatise on automobiles in America.

This revised and enlarged 1913 Edition, just out, is especially prepared for those who want to learn the principle and construction of all parts of all cars, thereby enabling you to make repairs and adjustments in an intelligent manner.

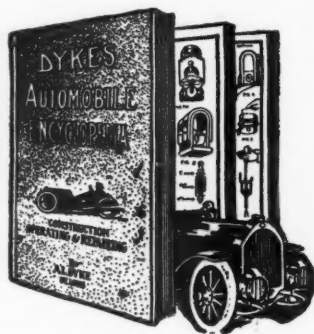
This book explains the principle and construction of all the different ignition, carburetion, cooling and lubrication systems, together with the different types of engines and their valve systems; how to set valves, time the ignition, etc.

THE DIGEST OF TROUBLES is very complete—by turning to the index the CAUSE and REMEDY of the trouble is given.

THE ADJUSTMENT AND REPAIR SUBJECT is probably the most interesting. The subject of repairing begins with cleaning a car; cleaning carbon, chemically and mechanically; grinding valves; testing compression; taking up lost motion in valve stems and plungers; setting valves and timing the ignition; how to set all leading magnetos; scraping bearings; how to test for knocks and how to locate them; meshing the timing gears; fitting piston rings; carburetor repairs and adjustments; rewiring a car; ignition troubles and remedies; timer troubles

and remedies; cooling troubles; how to clean and repair radiators; how to take up wear in differential; how to adjust the steering device; how to treat the clutch; lining up wheels, etc.

OTHER SUBJECTS—such as Building a Garage for Home or Business; Equipment of a Shop; Tires; Tire Repairs; Vulcanizing; Lighting a Car; Self-Starters; the Assembly of a Car; Transmission; Axles; Brakes; Differentials; Laws; Insurance; Metric Measurements Connected with English Measurements; Care of a Car.



ANOTHER FEATURE OF THE BOOK is the building-up process of a car, from the axles to the body; each part is added by means of progressive charts: First the springs are mounted on the axles, then the frame, then the power plant is mounted on the frame and each and every part is added until the car is completed. In this manner the reader learns the relation

of one part to the other. The engine and transmission are assembled in the same manner.

THIS BOOK IS DIFFERENT. The matter is arranged in the form of instructions, of which there are 40. The type is clear. There are over 1000 illustrations, in the form of large, clear charts, of which there are 239. The reading matter is so clearly worded, a ten-year-old boy can understand.

Price ^{Postage} _{Prepaid} \$3.00

Address Book Department, CLASS JOURNAL CO., 910 S. Michigan Avenue, Chicago

Big Output or Big Merit?

WE could easily quadruple our output by selling a six-cylinder car around \$2500. But it would be a gross violation of confidence.

To sell a Six at \$2500, it would be necessary for us to cut down quality, to skimp on workmanship, or, worse still, to assemble parts from other factories, instead of **building the complete car ourselves**. There are a thousand ways to cheapen a car, and every one of them, in our case, would be dishonest.

Keeping Faith with Buyers

For a company that has a low-grade reputation, a \$2500 Six might be a step upward. But for the Winton Company, whose Winton Six set the world's standard for six-cylinder quality and drove the best of fours into the second class, even the slightest cheapening of quality would be inexcusable—would be a betrayal of the confidence and good will of those thousands of Winton Six owners who believe in us and in our car, and, in good faith, urge their friends to buy Winton Sixes.

Millions of Good Will

This Good Will—the result of our producing highest-quality cars and of making good on every promise during our fifteen years in business—has a value, according to commercial reckoning, of millions of dollars.

Many companies list Good Will in their balance sheets, as an **asset**. We don't. We regard Good Will as a moral liability and obligation—an obligation never to betray public confidence by marketing under the Winton nameplate anything less than the **utmost best**.

Caution
Be careful in selecting a car—this year more than ever before. There are startling reasons why. Read them in our Book No. 41.

WINTON SIX

Long stroke motor, left drive, center control, electric lights, self-starter, finest mohair top, easily handled curtains, rain-vision glass front, best Warner speedometer, Waltham eight-day clock, Klaxon electric horn, tire carriers, four-cylinder tire pump, demountable rims, full set of tools, German silver radiator, metal parts nickel finished. Fully equipped, **\$3250**

Always Quality First

That's exactly why a big output has never tempted us. We make only as many cars as we can make **right**. And we make them **ourselves**. You'll never find a Winton motor in any other make, nor a Winton clutch or transmission, nor a Winton axle or steering gear. Winton Six merit is individual and exclusive.

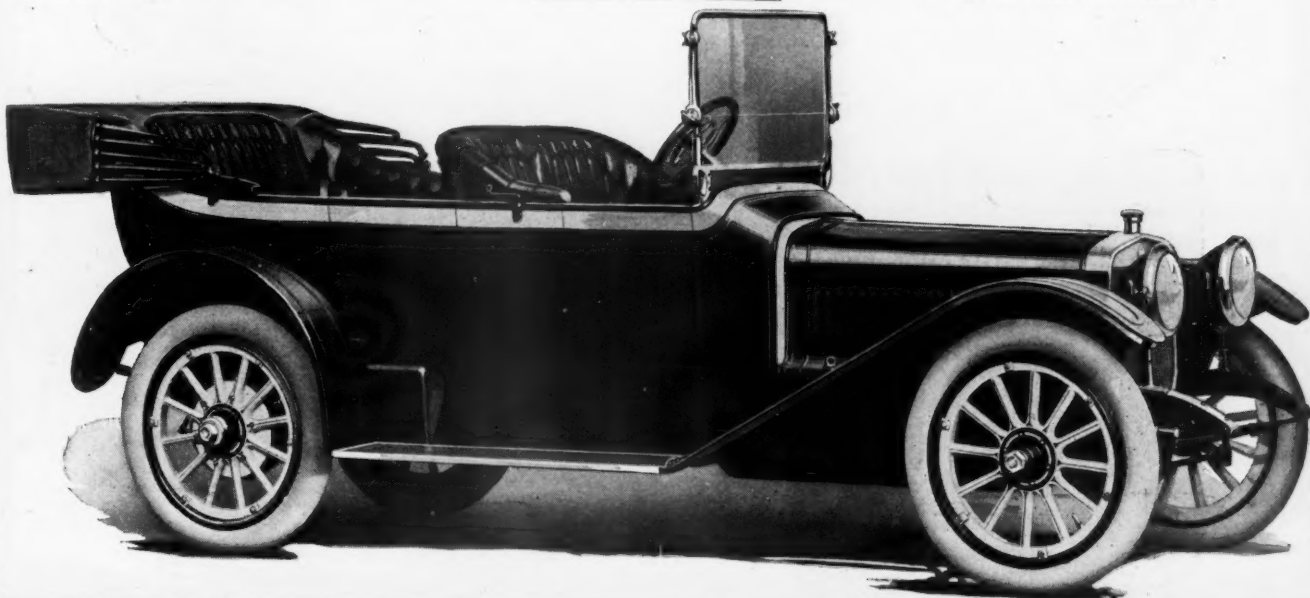
Why Price Stays Down

The Winton Six is sold at the lowest possible price that its merit can be sold for. We keep quality up because we will not abuse the trust of our patrons, and we are able to keep price down because we have no water in our stock, no bonds, no gold notes, no mortgages, no over-expanded plant, no excessive overhead, no wasteful executive methods.

Let us send you a catalog of the Six that leads them all.

The Winton Motor Car Co.

424 Berea Road, Cleveland, O.





Price, \$15.00

Over 51,000 Ford Owners Have That
SATISFIED FEELING



Because They Use The

Master Vibrator

which gives

**A Hotter Spark More Power
A Smoother Running Engine
Less Carbon Deposits Easier Starting
Cleaner Spark Plugs**



An honest article at a fair price—large, powerful condenser, genuine solid platinum-iridium points of generous size, strongly built kick switch—

The Standard By Which All Others Are Judged

OUR GUARANTEE—Try the K-W Master Vibrator for 30 days and if you can get along without it, return it and we will give you your money back and ask no questions.

SEND FOR DESCRIPTIVE FOLDER.

Improve the efficiency and appearance of your car by installing a



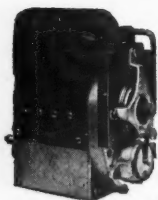
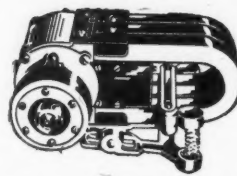
Electric Headlight Outfit \$40

Complete Outfit, Electric Generator, Headlamps, Switch, Wire and Bulbs.

Ford Outfit For Fly-Wheel Magneto, \$15.00



The K-W Generator can be easily installed on any car having exposed fly-wheel or other convenient place to belt or friction drive the Generator. This is the most simple, efficient and economical electric headlight outfit on the market. If you have lamps we can furnish you with the generator for \$25.00. Send for illustrated folder.



The K-W High Tension Magneto

The strongest made for the largest engine made. Positive results and entire satisfaction guaranteed. Give description of engine and ask for price. You can't make an engine too big for the K-W. No batteries needed to start.

WE PREPAY THE EXPRESS all the way on the K-W Master Vibrator and East of the Mississippi River on all our other goods when cash accompanies the order.



Give the
Street Number
Agents in principal cities.

2835

CHESTER
AVE.

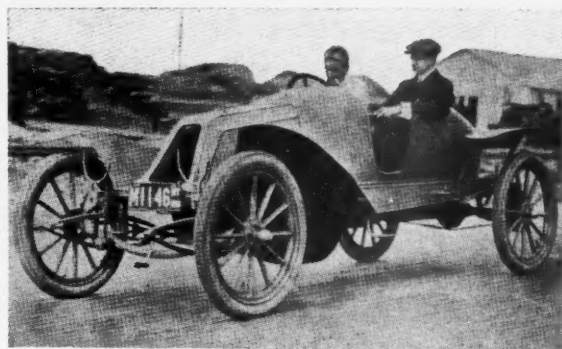
CLEVELAND, OHIO, U.S.A.

NEW YORK, E. J. Edmond, 1783 Broadway.

BOSTON, W. J. Forbes, 243 Columbus Ave.

The World's Record for Fuel Economy

Again Goes to the Franklin



THE Franklin has always been known as the most economical car to operate—economical in gasoline consumption, economical in tires and economical in repair expense. This fact, which has been established by countless performances in the past, was confirmed in striking manner a few weeks ago.

On June 20th, 1913, Mr. S. G. Averell of New York, a private owner, drove his special Franklin 83.5 miles on one gallon of gasoline over a course including city and country roads on Long Island. Mr. Averell

was accompanied by Mr. Herbert Chase, laboratory engineer of the Automobile Club of America, who acted as official observer. See the official report of the Automobile Club of America.

The previous economy record was held by a Franklin, which traveled 46.1 miles on one gallon in July, 1909. Even this was not the first Franklin Economy Record. In May, 1906, a Franklin won the Economy Test of the Automobile Club of America against a large field, with a record of 87 miles on two gallons of gasoline.

Franklin fuel economy is a long established fact. Franklin tire economy is almost as well known. In 1912 Franklin owners reported an average of 10,746 miles service per set of tires, with an average of 3,663 miles without puncture. Ninety-eight per cent of Franklin owners do not carry extra tires. Experience has taught them that it is unnecessary.

There is a reason for this unusual economy of fuel and tires. It is due to Franklin construction. By reducing the "unsprung" weight (i. e., the weight below the springs) to an absolute minimum, by distributing the necessary weight properly, by proportioning each part of the car in correct relation to every other part, we have produced a light, evenly balanced car which runs with very little propulsive effect and very little strain on the tires.

The following figures will show you why the Franklin is so easy on tires and why it burns so little fuel per mile. These figures will mean nothing to you unless you compare them with the actual weight of your own car. Weigh your car with its full road equipment.

Weights and Tire Sizes of the Franklin

Six "38" touring or phaeton 3328 pounds, tires 4½" and 5".
Six "38" 7-passenger touring 3480 pounds, tires 5".
Little Six "30" touring 2993 pounds, tires 4½".
Four "25" touring 2520 pounds, tires 4".

These weights include full equipment, gasoline and oil. Compare these weights and tire sizes with other cars. Franklins 700 to 1,200 pounds lighter, are equipped with tires as large or larger.

The Franklin direct-cooled engine is largely responsible for Franklin fuel economy. Gasoline consumption is cut squarely in two because direct cooling permits the motor to operate at the temperature of maximum efficiency for gasoline vapor. Fuel is saved from two ends, the smaller amount consumed per unit of horsepower and the smaller amount necessary to produce power to drive the lighter car.

The Motor Cannot Stall

The Entz electric starting system used on Franklin cars makes it im-

possible for the engine to stall. One switch controls both the starter and magneto. Throw on the switch and the starter goes to work. If by accident you cut off the gas the starter picks up the motor, and, as you give it gas again, away it goes.

The Best Car for Dealers

From the dealer's standpoint the Franklin is the most distinctive high-grade car on the market. It eliminates competition. It enjoys a clean unbroken record of success for more than eleven years. Franklin dealers are making money and have always made money.

We will be glad to mail on request a copy of O. K. Parker's interesting story "A Strenuous Trip Into the Grand Canyon of Arizona." Mr. Parker is chief engineer of the Automobile Club of Southern California.

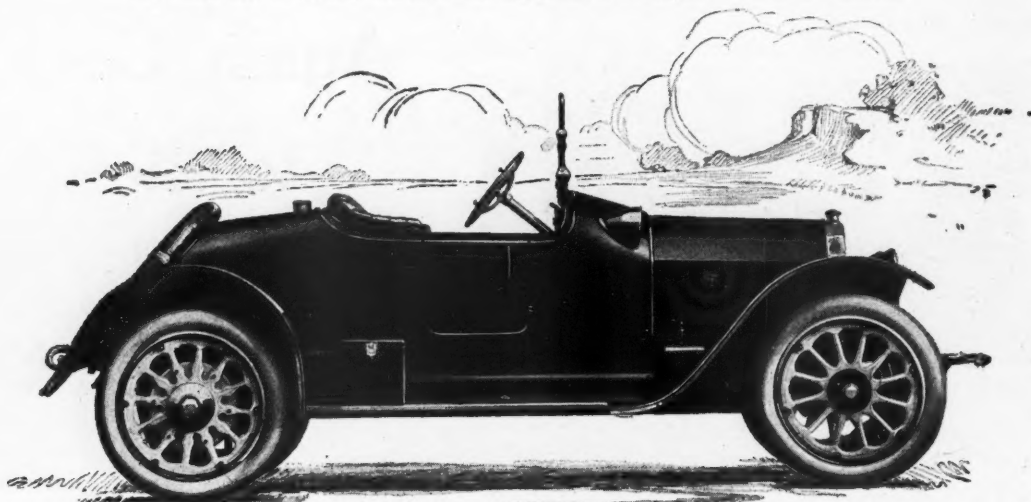
Franklin cars are made as follows:

Franklin Six "38" 5-pass. touring...	\$3600
Franklin Six "38" 4-pass. phaeton...	3600
Franklin Six "38" 7-pass. touring...	3850
Franklin Little Six "30" touring-car or 2-pass. phaeton.....	2900
Franklin Four "25" touring.....	2000

Write for our catalogue—a book full of real automobile facts

Franklin Automobile Co., 27 Franklin Square, Syracuse, N.Y.

The Pathfinder is the only medium-sized high-grade car designed and built in America



40 horse power

PATHFINDER ROADSTER

120 inch wheelbase

Harmony of design in the PATHFINDER marks it a car of Quality

¶ Do you buy motor car novelties such as are sometimes used to draw attention away from obsolete, faulty design or is your choice of car backed up by knowledge of *quality* in:

- materials used? —expert workmanship?
- chassis design? —finish and appearance?

¶ You must not assume that the Pathfinder is the right car to buy because the electric starter is 100 per cent. efficient, or because the instrument board is under the cowl, within easy reach of your hand, or because the beautiful lines of the Pathfinder excite admiration whether on city boulevard or country by-way.

¶ **Remember!** The purchase of a motor car means years of either disappointment or genuine pride and enjoyment of ownership. In the Pathfinder you get more complete accessories than you will find on any other car, yet it is primarily quality construction and quality materials combining quality design that challenge your attention and urge your investigation of the value-giving Pathfinder.

¶ You will like the Pathfinder. The car lives and makes friends even in its old age. Renewable bearings make this possible. Pathfinder motor cars will run quietly in their fifth year of active service.

¶ That is the *real* reason you should



invest your money in such a car as the Pathfinder. A close study of the "**101 Reasons**" and comparisons with other high-grade cars will help you to decide. Get the "**101 Reasons**" and other 1914 Pathfinder literature by writing today.

THE MOTOR CAR MFG. CO.

1132 Division Street

Indianapolis, U. S. A.

Write your name on the margin and get 1914 Pathfinder literature

"American" Axles

Daily Prove the Worm Drive's Extraordinary Qualities



FULL FLOATING *"American"* Axles with the Lanchester-Daimler Worm Drive have been regular products of this company for nearly two years. They have successfully met every test required for gasoline and electric pleasure cars of the highest grade.

The Lanchester-Daimler Worm Drive has simply duplicated in America its splendid record abroad. It is the very best form of a type of gear whose merits are beyond question.

When we secured the sole American rights as axle manufacturers of this drive, motor car builders acknowledged that its perfect production by us for both gasoline and electric pleasure cars was a foregone conclusion.

They knew that we would bring to its construction the same quality of engineering skill that has given the first place to our Bevel Drive Axle, and which is responsible for the fact that today 80% of the high grade electric pleasure cars in this country use either that or the Lanchester-Daimler Worm Drive in an *"American"* Axle.

THE AMERICAN BALL-BEARING CO., Cleveland, Ohio



FOR YOUR TOUR



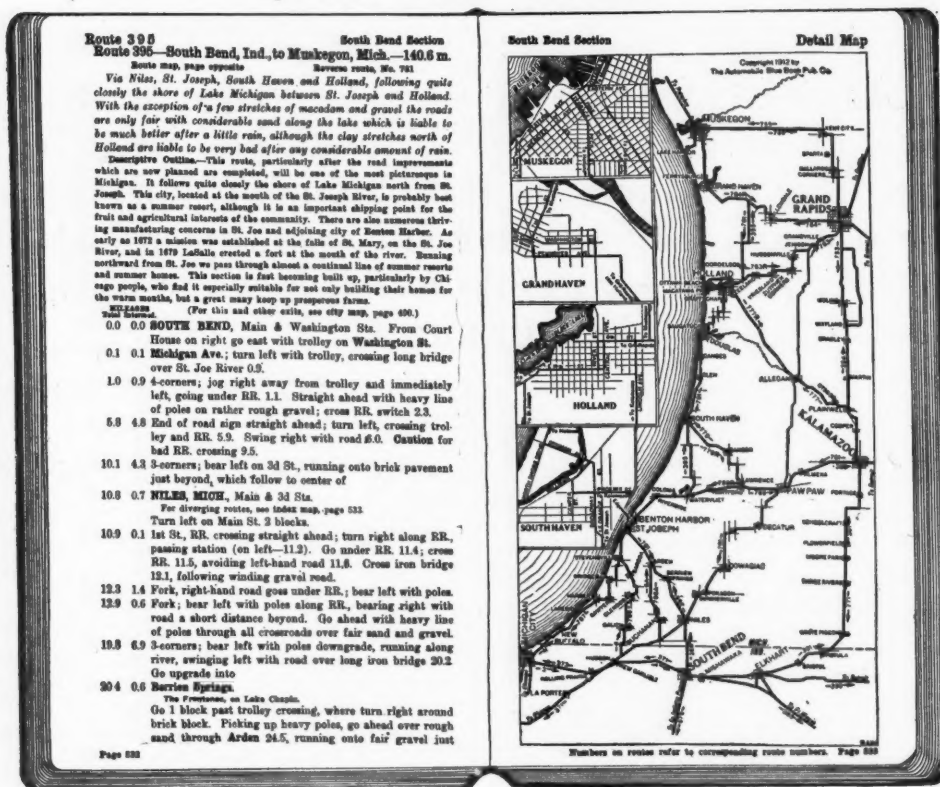
Do you realize that an accurate road guide is just as necessary to your comfort and convenience as an extra tire?

A reliable route book will save you an average one to two hours each day you tour, because you are saved the trouble of asking dozens of questions. Furthermore, with a good guide you are able to plan in advance your whole trip, know accurately all road conditions, mileages, noon and night hotel and garage accommodations.

The Official Automobile Blue Books are the only guides fulfilling all these requirements, and with the complete set you can cover the whole United States and the tourable sections of Canada.

- Volume 1—New York and Canada.
- Volume 2—New England and Maritime Provinces.
- Volume 3—New Jersey, Pennsylvania and the Southeast.
- Volume 4—The Middle West.
- Volume 5—Mississippi River to Pacific Coast.

\$2.50 The Volume



Here are two specimen Automobile Blue Book pages, one-half actual size. The combination of maps and road-data will be appreciated at a glance. Distances and landmarks are noted down to the tenths of miles—the motorist's odometer is his compass. And all routes are indexed, under an ingenious system that gives ready access to the information desired. The finished product of a decade's experience.

Book Dept., CLASS JOURNAL CO., 910 S. Michigan Ave., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age.



SHELDON STEEL WHEELS WILL OUTLAST *any* TRUCK MADE

Every day that a wooden wheel is in service its value is lessened. Every shock it receives—every jar and jolt—weakens it to some extent. In time the *best* wooden wheel will break down under continual disintegration. If it should break down in *actual service*—who can forecast the result?

But Sheldon Steel Wheels are indestructible. No amount of jarring, jolting or pounding will lessen their value one whit. Everything considered, they are fully as serviceable when the truck goes out of commission as the day when the truck was bought.

Sheldon wheels counteract tremendous side pressure. They are constructed of one solid piece—hubs are bored to receive the bearings; rims turned to carry the tires. There are no flange bolts to work loose—absolutely nothing to weaken.

The best efforts of a splendid technical organization assure you of the most efficient wheel equipment.

Sheldon Wheels make a good truck better. In the long run they are many dollars cheaper than the ordinary artillery wheel.

Investigate these facts. Write us today for complete information.

SHELDON AXLE COMPANY
WILKES-BARRE, PA.

Chicago Office:
68 E. 12th St.

San Francisco Office:
444 Market St.

Detroit Office:
1215 Woodward Ave.

Here's a High Grade Motor Truck Easy to Buy, Easy to Operate and Easy to Pay For

You couldn't ask for more than we offer you in the

Selden One-Ton Truck

every feature of which compares favorably with trucks selling for double the money.

The price is \$2000 but so confident are we of the absolute dependability of this truck that we let you put it into service upon payment of only \$500 down and the balance in twelve monthly installments of \$125 each. This practically allows the Selden to earn its cost during the time you have to pay for it.

THE SELDEN TIME PAYMENT PLAN

has proved popular with hundreds of firms that did not feel that they could spare the full purchase price from their working capital at one time, and should appeal to you.

Investigation will prove the Selden is the Truck you want and on terms that you can afford.

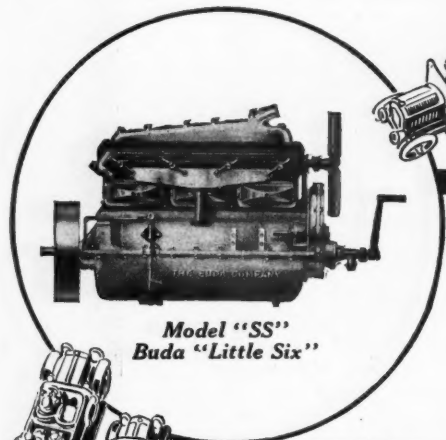
Agents wanted in unassigned territory

Selden Truck Sales Company

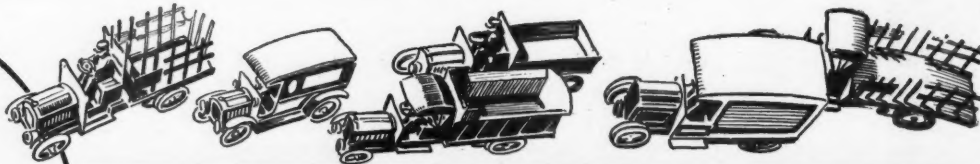
261 East Avenue

Pioneers in Selling Trucks on Time

Rochester, N. Y.



Model "SS"
Buda "Little Six"



More Buyers Every Day Insist on

BUDA MOTOR

"THE PART THAT SELLS THE CAR"

Modern complexity has brought into being the *Specialist*. Each "thing" we make is really a combination of many things, each of which may be a life work.

An Author writes a "book"—really a bundle of manuscript. He's a *Specialist* in ideas—like an *automobile designer*.

He turns the "book" over to a "Publisher" (who is a *Specialist* in the business end of book making.)

Can a Publisher "publish" a book by himself? Not without the aid of the Binder, a *specialist*. And neither can the printer print nor the binder bind without the Ink *Specialist*, the Paper *Specialist*, the Glue *Specialist* and all the others, *each doing ONE THING WELL*.

Can a car manufacturer manufacture a car? **NO.** Never could, cannot now, never will. And the tendency of the public is to realize this more and more, and (for the sake of **ECONOMY** and **QUALITY**) to insist on the BUDA MOTOR, made by a Successful *Specialist*. Always look under the hood. It's a good habit.

THE BUDA COMPANY

FACTORY, HARVEY, ILL., (Chicago Suburb)

Address all correspondence to our **FACTORY REPRESENTATIVES**

BRANDENBURG & COMPANY

1108 S. MICHIGAN AVE., CHICAGO

57TH & BROADWAY, NEW YORK

FORD BUILDING, DETROIT

When Writing to Advertisers, Please Mention Motor Age.

No Garage is Complete Without

WEAVER AUTO TWIN JACKS

"I couldn't keep house without them"—that is the way one of our many thousand enthusiastic patrons expressed his appreciation. It is impossible to fully realize the many advantages of these jacks until you have tried them and have actually SEEN the saving in dollars and hours which they effect.

Try to impress upon your mind ALL the combined advantages of a ball and roller bearing

Turntable, A Transporting Truck, Set of Lifting Jacks and Tire Rests.

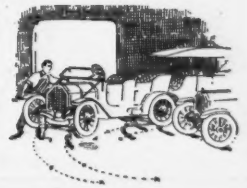
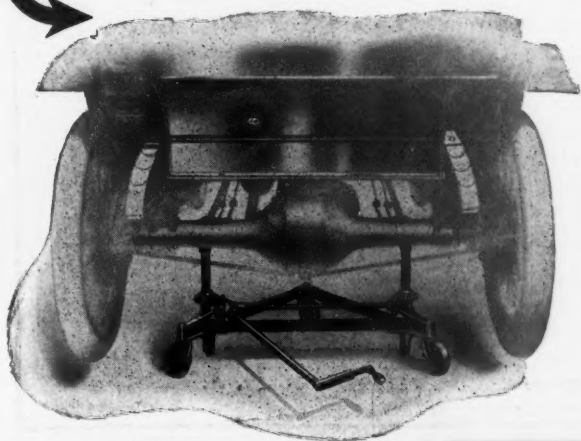
You have them all in a convenient unit in Weaver Auto Twin-Jacks at the very nominal cost of

2 for \$20.00 (One for Each Axle)

With Liberal Discount to Dealers.

Full Ball and Roller Bearing throughout enables them to handle the heaviest pleasure cars with perfect ease.

WEAVER MFG. COMPANY
2165-9 S. 9th St., SPRINGFIELD, ILL.



Why Our Sales Increased Over 400% In Two Years

You Can't Beat This Equipment at Twice the Price

- 1—Automatic Dynamo Lighting System
- 2—Motor-Driven Tire Pump
- 3—Unit Power Plant
- 4—Long Stroke Motor with Enclosed Valves
- 5—Center Control
- 6—Left Side Drive
- 7—Electric Side Lamps in Dash
- 8—Electric Head Lights and Tail Lamp
- 9—Self-Starter
- 10—Floating Rear Axle with Pressed Steel Housing
- 11—Demountable Rims (Baker Bolted-on)
- 12—118-inch Wheel Base
- 13—Goodyear No-Rim-Cut Tires

Glide

THE approval of dealers—the approval of users—has given the *Glide* car a remarkable boost in sales and popularity during the last two seasons. This approval, for one thing, is founded on the fact that the *Glide*—from radiator to tail light—lacks nothing essential to the performance of the car or the comfort of the passengers; that it has **strength** (endurance) to take steepest hills, go over all sorts of roads without wavering; that it has **power** (speed) ample to keep it ahead of the crowd, and plenty in reserve; that it has **appearance** (lines and finish) which places its value far above the low price asked for it.

Another thing, the *Glide* appeals to both classes of buyers—the man who wants a better car at a lower price—the man who wants a car he can be proud of, regardless of price. for agency in their locality. The selling possibilities of the *Glide* are tremendous for the simple reason that a *Glide* dealer has a car that his competitor can't touch in quality or price. Catalogs free.

Dealers Are Invited to Write Us

THE BARTHOLOMEW CO. 215 GLIDE STREET
PEORIA, ILLINOIS

\$1690

Write
Us
for
Agency



Model 36-43, Five-Passenger
Touring, Fully Equipped.

When Writing to Advertisers, Please Mention Motor Age.



Service Stations

for Electrically Lighted Cars

For the convenience of car owners Edison Mazda Automobile Lamp Service Stations have been established all over the country for the renewal of lamps.

These stations enable the motorist to readily obtain the right kind of lamp that will give the most efficient and satisfactory service with the lighting system on the car.

Edison Mazda Automobile Lamps may be

obtained wherever either of these signs are seen—locally or when touring.

Look for the signs; they indicate progressive dealers and garages where other high-grade automobile accessories may be purchased.

Remember every sign like the above means lamp service—service backed by the largest electrical manufacturer in the world.

General Electric Company

Edison Lamp Dept.

Lamp Agencies Everywhere

Harrison, N. J.

4211

Billings & Spencer Tools

"The tools that are guaranteed"



No tools bearing flaws, faulty workmanship or the smallest deficiencies are allowed to leave the shop. The triangle trademark is found only on a perfect tool.

Write for Catalog

The Billings & Spencer Co., Hartford, Conn.

You Pay For Them Anyway—Now Get



GABRIEL Rebound Snubbers

(Used by practically all the leading car builders.)
(Standard equipment on the easiest-riding cars—)
PEERLESS STEARNS WHITE

Cars not equipped with Gabriel Snubbers pay for them anyway, in increased up-keep repair expense and shortened life of car; all of which Gabriels would have prevented.

Gabriels cost from \$25 to \$40 per set of four, half that per pair, and repay this amount many times over in reduced maintenance, increased life of car and matchless riding comfort.

Let us send you full information and name of nearest dealer so that you can arrange a trial.

GABRIEL HORN MFG. CO., 1415 E. 40th ST., CLEVELAND, O.

Makers of the famous GABRIEL Musical Horns and Auto Accessories

Tire troubles? You can't have any—with

You can't have punctures or blowouts with an airless tire—there's nothing to puncture or blow-out. And you can have ease and comfort (Dayton Airless Tires are smoother riding than pneumatics).

And you can—and do—have complete freedom from the worry, delay, vexation and expense that go with punctures and blowouts.

You're not only getting rid of tire troubles if you are using Dayton Airless Tires, you're getting longer wear, and saving the expense of extra tires, casings etc. We guarantee Dayton Airless Tires for 5000 miles (8000 on a light car like the Ford).

They cost you more when you buy them; they cost you far less as you use them. Besides the big difference in tire repairs and accidents there's a definite sum of \$102.70 to be saved by using Dayton Airless Tires. Ask us to show you how.

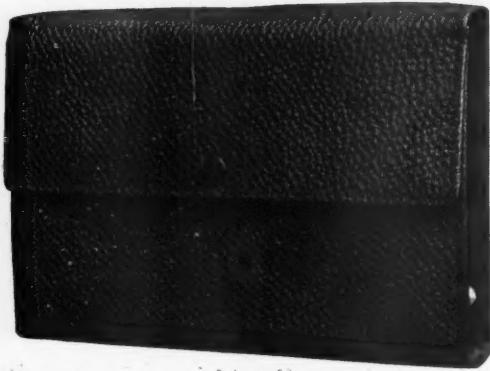
DAYTON AIRLESS TIRES

To Agents: Write us about territory for this practical sure-selling line of tires.

Dayton Rubber Mfg. Co., DAYTON, OHIO

Dayton Airless Tire Co. 1276 Broadway, New York, N. Y.
 Dayton Airless Tire Co. 539 Boylston St., Boston, Mass.
 Dayton Airless Tire Co. 80-84 W. Mohawk St., Buffalo, N. Y.
 Dayton Airless Tire Co. 2123 Michigan Ave., Chicago, Ill.
 Dayton Airless Tire Co. 332 N. Illinois St., Indianapolis, Ind.

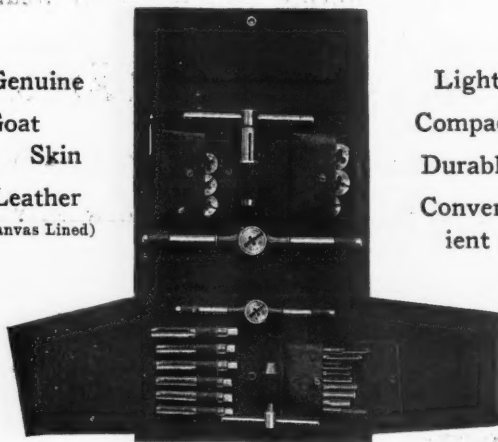
Put This in Your Auto-coat Pocket



Then when the
Emergency Arises

open it out like this

Genuine
Goat
Skin
Leather
(Canvas Lined)



Light
Compact
Durable
Convenient

Has 16 Taps, 16 Dies, 2 Stocks and 2 Tap Wrenches.

Cut a Screw Thread and Ride Home on your own gasoline

This is not a cheap bargain counter eye catcher. The Taps, Dies, Stocks and Tap Wrenches are of the same high standard that has kept Wiley & Russell Mfg. Co. in the front rank for over 40 years as makers of first quality screw cutting tools.

MANUFACTURED BY

WILEY & RUSSELL MFG. CO.

GREENFIELD, MASS.

New York
90 Center St.

Philadelphia
38 N. Sixth St.

Chicago
545 W. Washington Blvd.

SEE ONE AT YOUR DEALER'S

PUBLIC SALE of Valuable Manufacturing Plant

of Hart-Kraft Motor Co., York, Pa.—On **Tuesday, August 12th, 1913**, at 2 o'clock p. m., the undersigned receiver of Hart-Kraft Motor Company, in pursuance of an order of the Court of Common Pleas of York County, Pa., sitting in equity, will offer for sale on the premises on North Duke street, north of the Northern Central Railway passenger station, in the City of York, Pa., all that valuable manufacturing plant known as Hart-Kraft Motor Company.

The real estate consists of a tract of land fronting on said North Duke street 115 feet and extending eastwardly, of uniform width, 265 feet to a public alley. The property is bounded on all four sides by open public thoroughfares, and is adjacent to the freight and passenger depots of the Northern Central Railway Company and the Western Maryland Railroad Company.

The improvements consist of a modern four-story brick factory building, with brick engine and boiler house and brick oil house attached.

The factory has been and is being used for the manufacture and sale of the well-known Hart-Kraft delivery wagons, and is fully equipped in all departments for manufacturing, assembling, painting, finishing and fully equipping such vehicles. The building is equipped with modern freight elevator and modern system of sanitation and lighting.

The Receiver will also offer office furniture and fixtures, jigs, patterns, blueprints, automobile parts and unmanufactured materials.

Further and more complete details as to the plant, its business and equipment will be furnished by the Receiver on request and the plant will be open for inspection to prospective purchasers at any time after August 1st on notice to the Receiver.

TERMS OF SALE.

At the time the property is struck down, the purchaser shall pay to the Receiver \$10,000 in cash, or give his note with security to be approved by the Receiver for the payment of the same within 10 days from the day of sale.

He shall pay \$10,000 within five days after the final confirmation of said sale, and the balance within three months after said final confirmation.

Within 30 days after said final confirmation the purchaser shall give security, to be approved by the court, for the payment of the balance of the purchase money or at his option within said 30 days pay the said balance, or pay part thereof and give security as aforesaid for the remainder thereof. All purchase money not paid 30 days after the final confirmation of said sale shall bear interest from 30 days after the confirmation of said sale to the time of payment.

A proper deed or deeds and possession of the property shall be delivered to the purchaser at any time after the purchaser shall have paid \$20,000 of the purchase money and shall have paid or given security for the payment of the balance of the purchase money, or shall have paid part of said balance and given security for the remainder.

The property will be sold free and clear of all liens and encumbrances.

W. S. Owen & Bro., Auctioneers. DONALD H. YOST, Receiver, York, Pa.

Bosch Plugs



THE use of Bosch Plugs among all classes of motorists is rapidly extending. Their consistent reliability, the result of years of investigation and experience, makes Bosch Plugs unequalled in efficiency and length of service.

70% of the winners in the 500 mile race, the test of tests, used Bosch Plugs.

\$1.00 from your dealer. If he has not stocked, order each direct.

Write for "Locating the Spark Plug." It's free to you.

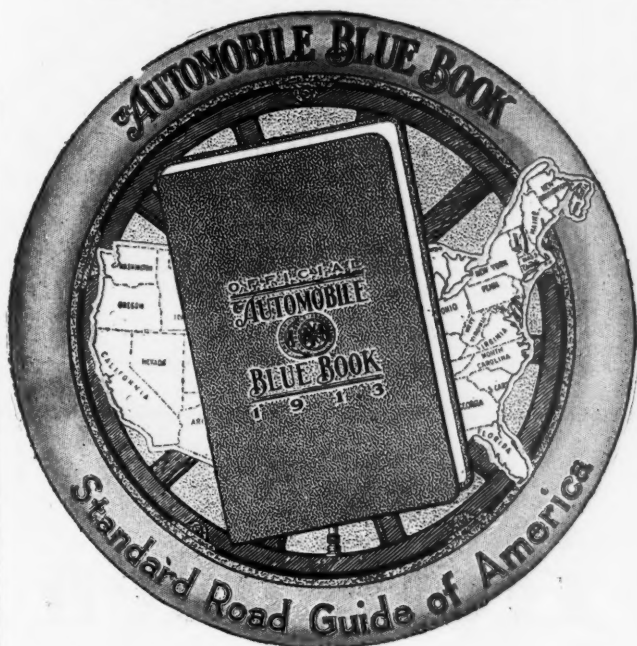
BOSCH MAGNETO COMPANY
214 W. 46th Street NEW YORK

Why waste tangible dollars in going miles out of the way?

There's a practical, economic means of knowing the right road to take miles before you come to it—

The Automobile Blue Book

Always Knows — It Saves Miles



Make it a part of your touring kit.

Bound in royal blue flexible leather

On sale at leading automobile supply houses, good book stores, many hotel newsstands, and at all Blue Book Touring Bureaus. Or sent prepaid upon receipt of price,

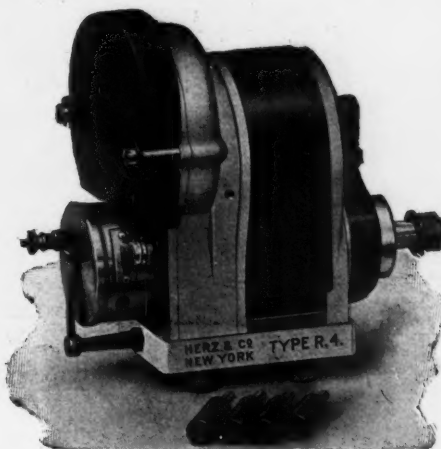
—\$2.50 per volume—

- Volume 1 New York and Canada
- Volume 2 New England and Maritime Provinces
- Volume 3 New Jersey, Pennsylvania and the Southeast
- Volume 4 The Middle Western States
- Volume 5 Mississippi River to the Pacific Coast

THE
Automobile Blue Book Publishing Company

910 So. Michigan Ave.
Chicago, Ill.

2162 Broadway
New York



HERZ MAGNETO

HERZ MAGNETO is far superior to other Magneto. In the official English test against 15 competitors, it was adjudged the most efficient Magneto of its size and weight by 25%.

HERZ MAGNETO is small and light, and absolutely protected against atmospheric conditions, dust and moisture. It was run completely submerged in water for 16 days at this winter's New York and Chicago Shows.

The strength and reliability of HERZ MAGNETO are attested by the fact that it is used by so many of the most experienced motorists.

HERZ & CO., 295 Lafayette St., New York
Makers of the HERZ PLUG

"Ford" Shock Absorbers

FIVE
DOLLARS
THE
SET



1
FOR
FRONT
2
FOR
REAR

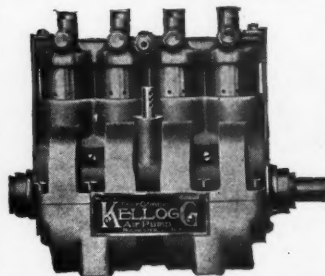
Made for "Ford" cars only—fitting any model
Our "Buckeye" Ford Shock Absorbers guarantee Easy
Riding on the Roughest of Roads.

Absolutely prevent broken springs, the absorbers taking the shock
when springs rise above their neutral position. Front absorber also
prevents excessive compression of front spring. Full oil tempered
springs of best quality—attached in a few minutes' time—no holes
to drill—simply clamp to frame.

\$5.00 per Set of Three (Shipping weight, 7 pounds)

At all jobbers and dealers, or sent direct on receipt of price.

Manufactured by
THE CENTRAL BRASS & FIXTURE CO., Springfield, Ohio
CANADIAN DISTRIBUTORS
JOHN MILLEN & SON, Montreal, Toronto, Winnipeg, Vancouver



Automobilists
who experience
the least tire
trouble invariably
possess cars
equipped with
the

Four Cylinder
KELLOGG
Air Pump

because it inflates the largest tires to any
desired pressure in the shortest space of
time, and makes the pumping of tires a
pleasure instead of a task.

That's why most of the principal car
manufacturers have adopted the Kellogg as
permanent equipment, and why the fore-
most engineers pronounce it the most prac-
tical tire pump ever produced.

Your dealer will be glad to put a Kellogg
on your car. For more complete informa-
tion, send name of car.

KELLOGG MFG. COMPANY

83 Circle Street

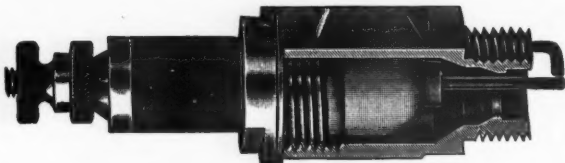
ROCHESTER, N. Y.

CHICAGO, NEW YORK, SAN FRANCISCO,
1108 Michigan Ave. 1733 Broadway 444 Market St.

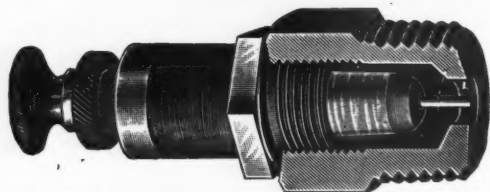
THE OAKES & DOW CO.

SPARK PLUGS

SOOTLESS



COMET



For Highest Compression Engines

In an actual test of 12 best known makes
of plugs, our "Sootless" made good—the
other eleven could not stand up.

MANUFACTURED AT

15 Chardon Street BOSTON, MASS.

The
Hollenden

European Plan

800 Rooms

**Rate with Bath
\$2.00 to \$5.00**

Automobile Headquarters

Cleveland, Ohio

BADGER GEAR COMPOUND

"Always on the Teeth"

STAYS where you want it. Clings to the gear teeth at all speeds. Won't pack on the sides of the gear case. Does not run thin. A perfect lubricant from every viewpoint. We also make the well-known F.V. Motor Oil and the Badger Lubricants. All these products have held their own, in actual service, under the most exacting conditions, and are covered by rigid quality guarantee.



**STOP
THAT NOISE**

**Badger Gear Compound
Will Make Noisy Rear Axles
and Transmissions**

KEEP QUIET

Ask Your Dealer

or
**WADHAMS
OIL CO.**

Users

**Write for
name of
nearest dealer**

Dealers

**Write for
prices and ter-
ritory on biggest
seller you ever had.**

An Electric Lighting System at Moderate Cost

Throw away your old-fashioned oil lamps. You can now light your car economically with electricity. No need to install a dynamo or storage battery. Simply equip it with a set of

J-M MOBILITE LAMPS

These lamps can be operated for one-third as much as standard equipment. They give a light of remarkable brilliance. Used for dash lights, tail lights and for illuminating speedometer and interior of car. Also for motor boats, camps, etc.

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That's the money and tire-saving advantage now offered motorists by the Positive Steam Vulcanizer. A dead sure way to cut tire costs and increase tire mileage. Find out all about the new

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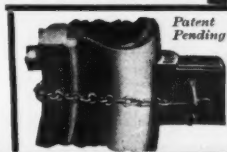
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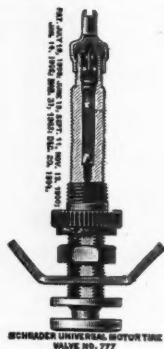
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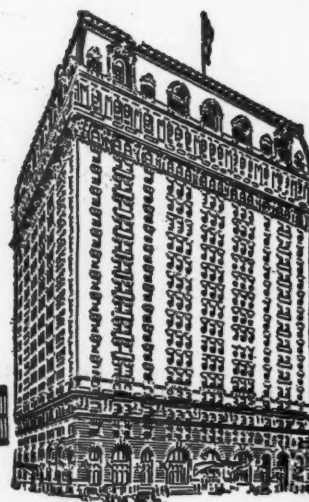
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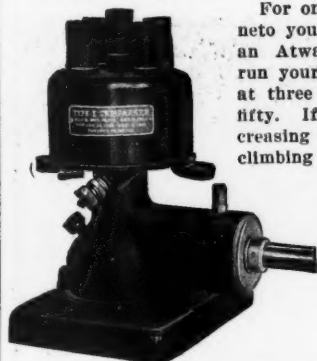
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Even if your motor has no timer
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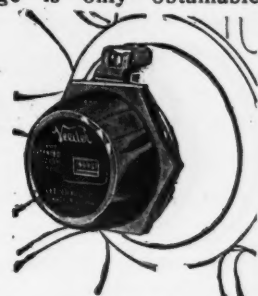
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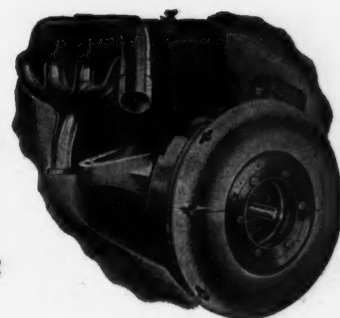
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The U-S-L doesn't add a single extra moving part to a car.

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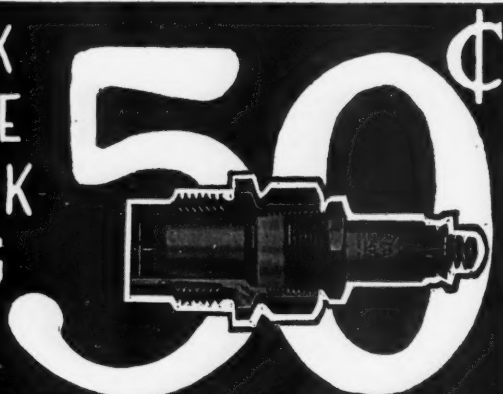
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They cut down tire bills

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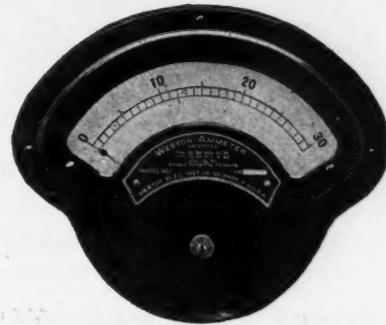
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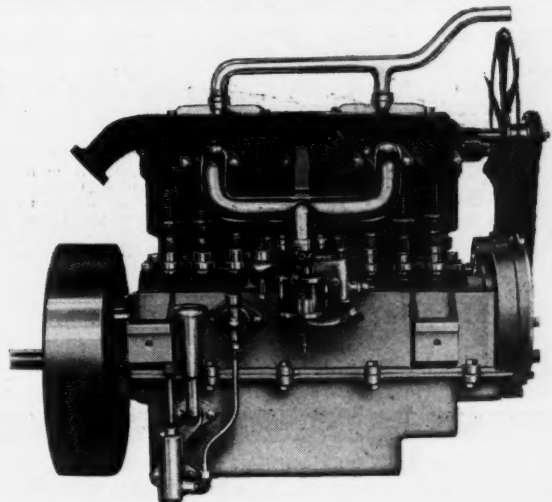
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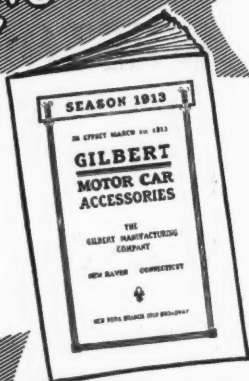
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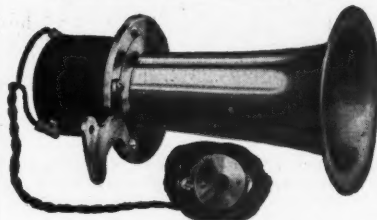
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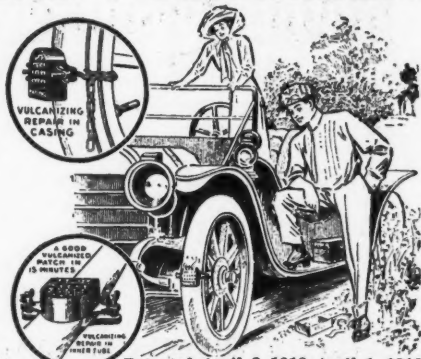
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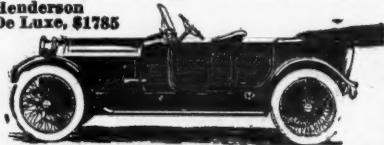
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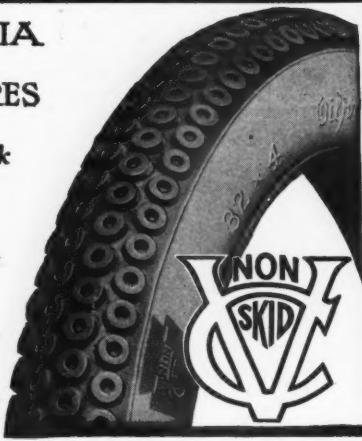
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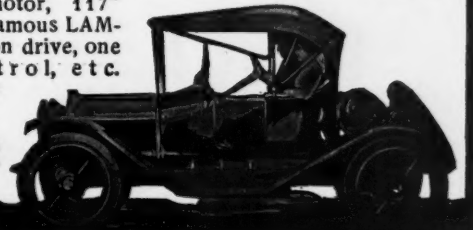
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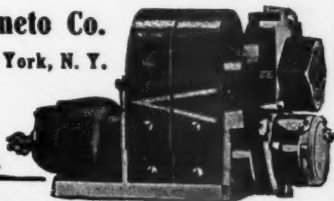
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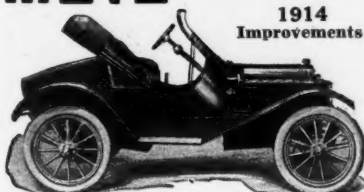
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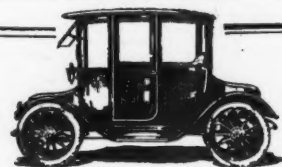
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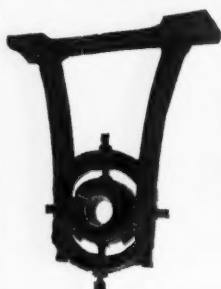
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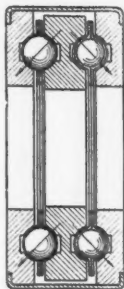
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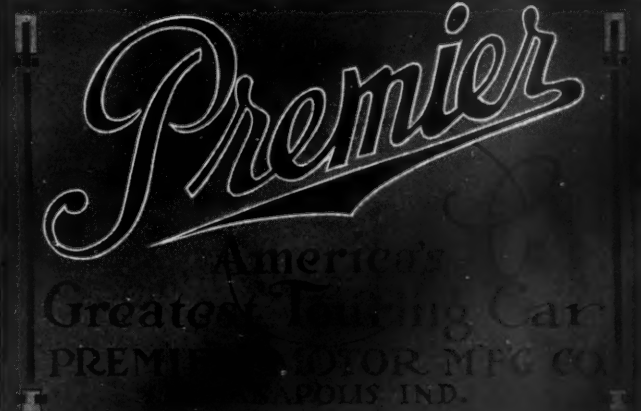


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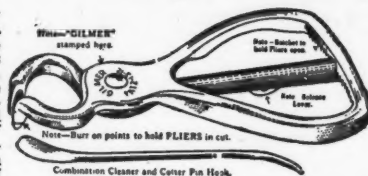
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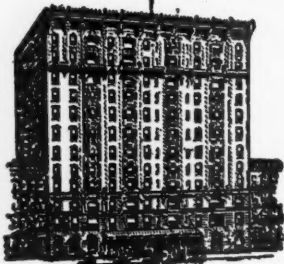
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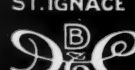
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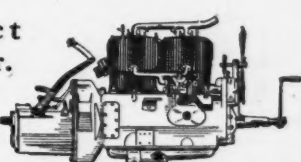
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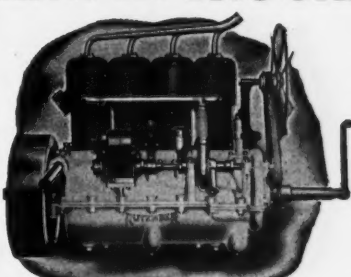
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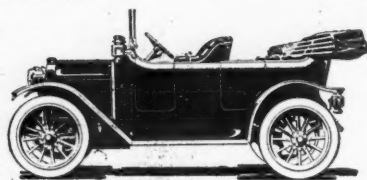


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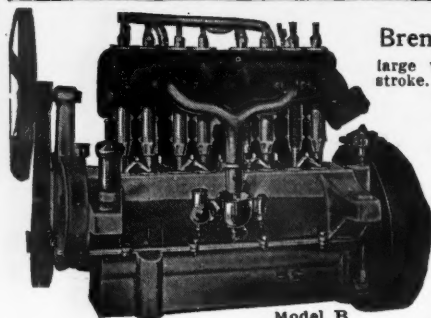
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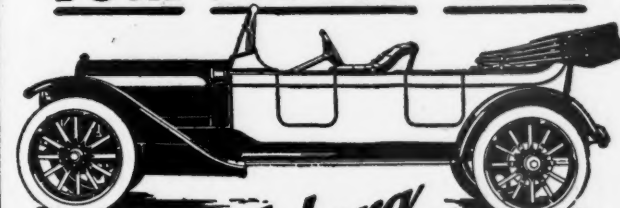
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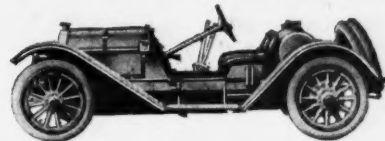
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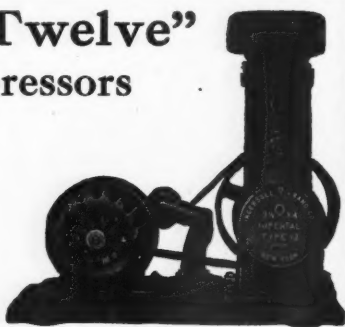
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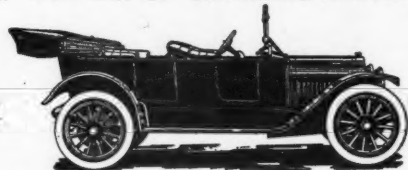
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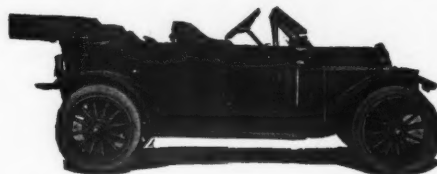
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Marathon Automobiles

America's most comprehensive line. Every car completely equipped. 3 sizes chassis—10 body styles. Price range from \$875 to \$1800

Write for Catalogue M-A

MARATHON MOTOR WORKS, Nashville, Tenn.

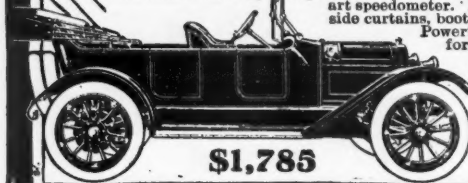
The Kentucky
Thoroughbred

Ames "45"

With Electric Self-Starter. An Electric Starter of proved efficiency is one of the features of the Ames "45"—a car with every essential refinement contributing to comfort, yet priced at \$1,785. Without Starter, electric lighted \$1,635. Made with well-known "Amesbilt" body, 5-passenger, motor-driven electric lights. Perfect cooling system. Force-feed pump. Schebler Carburetor, new Remy dual system high tension magneto, oil-driven pumps. Sight-feed. Warner multiple disc, Raybestos-lined clutch. Selective transmission, 3 speeds forward and reverse. Stewart speedometer. Best mohair top, side curtains, boot. 36x4-inch Tires.

Powerful, speedy—comfortable—unequalled at price. Write for catalog.

AMES MOTOR CAR COMPANY
Owensboro, Ky.



\$1,785

A Shot in the Dark

Seldom Hits Anyone But the Wrong Fellow

The same axiom applies to advertising. An advertisement in "just any paper" may catch the attention of desired parties—but it is another case of shooting in the dark and hoping to hit the mark. If you really want the attention of motor car owners, dealers or manufacturers—if you want to shoot in broad daylight, with short range and a hair trigger, use

**MOTOR AGE
CLASSIFIED COLUMNS**
The Trading Center of the Motor Car Industry

THE MASTER CAR **FIAT** 16th YEAR

6 Cyl. 50 H. P. \$5000
4 Cyl. 55 H. P. \$4500
4 Cyl. 35 H. P. \$4000

F. I. A. T.
POUGHKEEPSIE NEW YORK

NEWTONE MOTOR HORNS

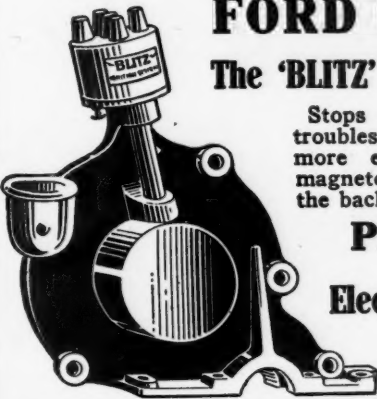
Are unreservedly guaranteed wherever sold. If your dealer does not carry the "Newtone" let us send one on approval



Torpedo Type
Price \$20

Automobile Supply Mfg. Co.
220 Taaffe Place, Brooklyn, N. Y.

FORD OWNERS
The 'BLITZ' Ignition System



Stops all of your ignition troubles. Makes your car more efficient. Uses Ford magneto current. Eliminates the back kick.

Price \$20.00

Electrical Specialties Mfg. Co.
Omaha, Neb.

SOLAR LAMPS

A discriminating public has voted in favor of Solars—the quality motor lamps.

Backed by 15 years of specialization. Found on more high-grade cars than all other makes of lamps.

A Solar Lamp for every motor need.

WRITE FOR CATALOG

THE BADGER BRASS MFG. CO.
KENOSHA, WIS. NEW YORK CITY

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop

TWITCHELL AIR GAUGE
and saves your tires.



"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

For sale by Jobbers, Dealers, Garages, or

The Twitchell Gauge Co.
1201 Michigan Avenue Chicago, Illinois

HAYWOOD STEAM VULCANIZERS
THE PROFIT MAKING PLANTS



The vulcanizing system that DOES NOT use air bags. SOLID PADS and HEAVY CLAMPS are the means through which pressure is generated.

Plants from \$25 to \$500

Write for Catalog B.

HAYWOOD TIRE & EQUIPMENT COMPANY
524 N. Capitol, Indianapolis, Indiana

WARD-LEONARD SYSTEM



WARDLEONARD

**Faultless Lighting
Infallible Starting**

Lighting - Starting

WARD LEONARD ELECTRIC CO.
BRONXVILLE N. Y.

Is Electricity Cheaper than Gas Light?

How much does a battery cost? How long are batteries lasting? How much do other repairs and replacements cost?

The average user of Prest-O-Lite pays \$10 a year, or less, for light.

If any editor, or any advertiser, claims that electric lights cost less to use than Prest-O-Lite, you can easily prove that he is either ignorant or worse.

If you want the facts, write us.

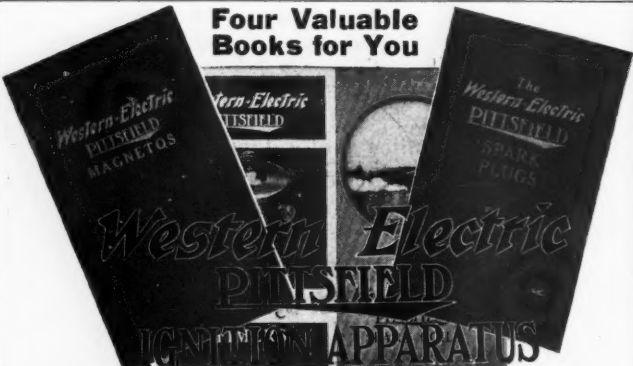
The Prest-O-Lite Co., 233 Speedway
Indianapolis, Ind.

The Kinsey Manufacturing Company, Toledo, Ohio

MANUFACTURERS OF AUTO PARTS

KINWOOD RADIATORS, FENDERS
KINWOOD OILERS, GASKETS,
KINWOOD STEEL FRAMES,
ETC., ETC.

SPECIAL METAL STAMPINGS



Four Valuable Books for You

WESTERN ELECTRIC COMPANY
Offices in New York and all principal cities



Simplicity the Supreme Factor

THE simpler your truck, the more you save. Chase Trucks could not be made more simple—their engines have only three moving parts in the cylinder. Hence our enormous light delivery sales—greater both this year and last year than any other manufacturer.

Write Dept. H-5 for complete information.

Six Efficient Models **Every Style of Body**
Capacities 500 to 4000 Lbs.

Chase Motor Truck Company
303 So. West St. Syracuse, N. Y.

HESS AXLES

HESS Axles have been on the market but 2 years. Fourteen car manufacturers in that short time exclusively adopted them as regular equipment.

Renewals of HESS contracts for 1913 from past users and an increasing HESS demand among new manufacturers, is ample proof of the stability of HESS Quality.

May we be of service to you? Write us.

THE HESS SPRING & AXLE COMPANY
Carthage, Ohio, U. S. A.

Economy is too big a matter to be found lurking in cheap prices.



TRADE MARK
NON-FLUID OIL
UNITED STATES PATENT OFFICE

Costs more than other lubricants for bearings and gears but its use reveals true Economy in dollars saved on repairs and in Efficiency retained in your car.

NEW YORK & NEW JERSEY LUBRICANT CO.

165 Broadway, New York
Chicago, 1430 Michigan Ave. Philadelphia, 1431 Vine St.

Simplicity, Strength, Durability—



Covert Transmissions

Three important points in

You would not think of putting an inferior motor in your car, would you? Superior transmissions are essential as the best motors.

COVERT MOTOR VEHICLE CO.

Sales Office: Ford Building, Detroit
Factory: Lockport, N. Y.

The Pilot "THE CAR AHEAD"

Three Great Models: Pilot 40—Four cylinders, 4½x5; brake test, 53 horse-power; 120" wheel base; price, \$2000. Pilot 50—Four cylinders, 4½x6; brake test, 59 horse-power; 126" wheel base; price, \$2250. Pilot 60—Six cylinder, 4x6; brake test, 67 horse-power; 132" wheel base; price, \$2500.

The Car Without a Mechanical Defect

Teetor "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Elsemann magneto, Stromberg carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States.

Write for our beautiful art book showing cars in detail

PILOT CAR SALES COMPANY

Richmond, Indiana



Patented

Don't omit a SPARKS-WITHINGTON Fan from your 1913 specifications. Our One-Piece blade, ball-bearing, radiator fan assemblies cool the motors of more high-class cars than any other fan on the market. There's a reason. SPARKS-WITHINGTON Fans deliver the greatest volume of air with the least H. P. consumption of any fan obtainable. Furthermore, their one-piece construction is positive insurance against blades which loosen, become detached and fly off. Undoubtedly one of our ten standard models is just what you have been looking for. Catalogue and detailed blue-prints on request. Get in touch with us.

The Sparks-Withington Co.
JACKSON MICHIGAN - WALKERVILLE CAN.

CLASSIFIED ADVERTISEMENTS

The Trading Center
of the
Motor Car Industry

MOTOR AGE

Rates—25¢ per line
Minimum Charge \$1.00
6 words to a line

Cars For Sale

A BARGAIN IN RACING CARS.

One 150 H. P. French car for exhibition purposes. This car has record of 100 miles in 72 minutes and 45 seconds. One of the best money-making cars in country today. Has a full set of extra parts and two new Michelin extra tires.

One 50 H. P. special built car with complete line of extra parts for racing equipment. These cars are in perfect shape and ready for the track, but have to sacrifice them on account of other business.

C. H. King, 6128 Prairie Ave., Chicago.
Phone Normal 5303.

A FINE SEVEN-PASSENGER THOMAS flyer, beautifully equipped; in perfect condition; cost new \$6,000; will sacrifice for quick sale. Address Box D 486, c/o Motor Age.

A GOOD BUY.

Why buy used cars when for \$850.00 you can get a brand new 35 h. p. 5-passenger Continental, formerly sold at \$1,450.00.

Martindale & Millikan,
1714 Michigan Ave., Chicago.

A LATE DOUBLE "M" FORTY HORSE-power White Steamer; fine condition and fully equipped, including kerosene burner. Has not run three thousand miles. Will sell cheap. Address Box D 469, c/o Motor Age. w

AUTOMOBILES AND PARTS; LARGEST stock ever known.

Progress Brokerage Co.,
527 Grant St., Buffalo, N. Y.

CREDIT EXTENDED ONE YEAR GUARANTEE ON REBUILT AUTOS.

Same as on new cars.
\$275 to \$900.

Roadsters, touring cars and trucks. Our one price of \$595 will buy any of following touring cars: Buick, Cadillac, Chalmers, Hudson, Lexington, Oldsmobile, Maxwell, Reo, Pullman, Ohio, Jackson, Crawford, Moon, Interstate, E-M-F.

Autos sold to all parts of the United States. Call, write or phone, Western branch of
AUTO TRADING CO.,
117 N. Dearborn St., Room 407, Chicago.
Telephone Central 1060.

FOR SALE CHEAP

One Twelve-passenger, sight-seeing car, Pullman body, in A-1 condition. Inquire of D. F. Poyer Company, Menominee, Mich.

FOR SALE—COLE 40, 1912; FULLY equipped, including seat covers, extra tire; perfect condition; will sacrifice. Address Box D 462, c/o Motor Age. h

FOR SALE—MODEL "M" FORTY HORSE-power White Steamer, beautifully equipped and in A1 shape. Has kerosene burner and works fine as silk. Will sacrifice. Address Box D 470, c/o Motor Age. w

FOR SALE—MODEL O-O WHITE Steamer in first-class shape; like new. T. M. Smith, 1969 Montrose Blvd., Chicago, Ill.

FOR SALE—10 "ATLAS" TAXICABS in running condition at \$300 each. Splendid opportunity for some one wishing to start in this money-making business, requiring but a small investment. Dan Condon, 2635 Wabash Ave., Chicago. w

KNOX 5 PASSENGER MODEL "R" 1910 touring car. 5 new casings, car equal to new, run 7,000 miles. For quick sale will take \$1275.00. Yeggy-Don Sales Co., Rock Island, Ill.

G. J. G. — SPECIAL RACING MACHINE capable of doing better than 70 miles per hour mounted on English style of wire wheels with Bosch racing magneto and motor modeled so as to have the minimum of friction to the maximum of speed. Equipped with New any make selected of standard tire equipment. Write for Photograph and specifications to G. J. G. Motor Car Company, White Plains, N. Y.

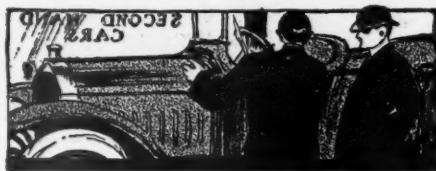
LOZIER 1911 FOUR-CYLINDER BRIAR-cliff; A1 condition. Electric lights; good tires carried at the rear. Rocky Mountain radiator and extra large fan. Equipment complete in every detail. Removable tonneau making a fast powerful roadster. Nothing can trim you with this car. Will go anywhere as fast or as slow as you want to ride. No trades, cash only. C. L. Newcomb, Jr., 768 Franklin Street, Denver, Colo.

MITCHELLS, REBUILT, GUARANTEED. These cars are fully equipped. Call or write for further particulars.

Mitchell Automobile Co.,
2334-36-38 Michigan Ave., Chicago.

THOMAS FLYER RUNABOUT 4-60—IN excellent condition. Must sell to settle estate. Will sacrifice if taken immediately.

E. R. M., 11 No. Harrison St.,
East Orange, N. J. a



A Good Reason

"We do not care to repeat the advertisement in reference to the Knight car at this time. We sold it through the MOTOR AGE advertisement. That's why."
H. H. W.

THOMAS FLYER RUNABOUT 4-60—WILL sacrifice for cash. Buying touring car.
H. C. Levin,
2160 Broadway, New York. a

UNDERSLUNG ROADSTER, SIXTY HORSE power; four speeds; 136-inch wheel base, 40x4½ tires; floating axle, imported bearings, complete with electric system; run hundred miles; worth three thousand—quick sale \$775.00. Address W. S. Reed, Martinsburg, West Virginia.

Parts and Accessories FOR SALE

A BARGAIN; STORAGE BATTERIES, 6-80 and 6-160; guaranteed; all makes, new and used, \$3.50 to \$10 for short time only. 4105-7 Cottage Grove Ave., Chicago. a

ACME REPAIR PARTS

We carry a complete stock of parts for all types of Acme cars. Can ship promptly. Adam E. Arnold, 212 S. 11th St., Reading, Pa.

A FEW FORD SPECIALTIES.

	Reg. Price.	Our Price.
Oil Gauges	\$1.00	\$0.35
Anti Rattling Ball Sockets. 2.50		1.25
Electric Lighting Outfits		
8-in. or 9-in.	9.00	3.50

Write for big summer catalogue, just out.
Globe Auto Specialty Co., Dept. F., 1775 Broadway, New York.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars.
Muskegon Automobile Co.,
Muskegon, Mich.

AUTOMATIC SPEEDER AND PRIMER.

Every car owner should have one, saves 25% on gasoline, starts motor with first turn of crank. The most rapid selling automobile device on the market. Agents wanted. Price, \$7.50 f. o. b. Frankfort. Automatic Device Co., 551 E. Jefferson St., Frankfort, Ind.

A WHITE STEAMER GENERATOR AND burner, almost new. Will sell cheap. Address Box D 245, c/o Motor Age. w

AUTO OWNERS IN SMALL TOWNS.

You can save one-half your tire expense and nearly all your tire trouble by using Security Reliners. Many of our customers run their cars the entire season without blowout or puncture and without spending a cent for tire repairs.

YOU CAN DO IT YOURSELF.

If we have no dealer in your town you can get a trial order at the dealer's price, and make a good profit selling to your neighbors. If you run your own car write at once for our plan.

SECURITY RELINER CO.,
301 Spring St., Montgomery, N. Y.
248 W. 54th St., New York.

BALL & ROLLER BEARINGS,

All Types and Sizes.

We also repair or exchange all makes of ball bearings.
THE GWILLIAM CO., 253 W. 58th St., N. Y.
1314 Arch St., Philadelphia.

BARGAINS.

New Mohair Tops, complete with side and storm curtains suitable for Fords, Buicks and Flanders touring cars....\$11.85
1 Gal. Brass Polish......40
Gas Lamps (black and nickel), 8½"... 4.25
Tail Lamps (brass)......1.00
30x3 Inner Tubes (new)......2.25
30x3½ Inner Tubes (new)......2.75
Electric Horns, complete......4.00
Terms cash with order. Money back if not satisfied.

Erwin Greer & Co.,
1456-64 Wabash Ave., Chicago, Ill.

BARGAINS IN SPARK PLUGS, SCHEBLER carburetors, metal polish, etc. Get illustrated bulletin. Automobile Appliance Co., 1712 S. Michigan Ave., Chicago, Ill.

BERGDOLL REPAIR PARTS.

The repair business of the Bergdoll cars, together with all drawings, jigs, patterns, etc., has been purchased by us. We have a complete stock of repair parts for all models on hand and orders for parts for Bergdoll cars should be placed with us direct to save time.

Louis J. Bergdoll Motor Co.,
124 N. 3rd St., Philadelphia, Pa.

CARBON CAUSES ENGINE TROUBLES.

By removing the carbon from your cylinders you eliminate 90% of your engine troubles. The M. H. B. CARBON REMOVER is saving thousands of motorists time and money by its use. Can be applied by any novice. Gives instant results. Acts like magic. Guaranteed to remove the carbon or money refunded. Price \$1.00 per quart, prepaid. Use 2 ounces (liquid) to one gallon of oil. Dealers write for special proposition. Interstate Mfg. Co., Inc., Walliston, Mass.

CELLULOSIA—BEST SUBSTITUTE FOR glass used in automobiles and buggy storm fronts, side curtains, etc. Sheet 20x36 in., 85 cents; 12x20 in., 35 cents, postpaid. Hawes Storm Front Co., Coldwater, Mich.

COMPLETE "VULCAN" OXY-ACETYLENE welding plants from "Vulcan" No. 1 with two oxygen drums (sold, not rented), non-backfiring torch, about 1/2 weight of average one, practical for garage or blacksmith shop at \$175.00. Larger plants have most simple acetylene generator made; no springs or clock work, but automatically makes gas as fast as it is used. Write us today for booklet on welding.

VULCAN PROCESS CO.,
25th & University Ave., S. E.,
Minneapolis, Minn.

CUT-OUTS.
E.M.F., Flanders, Buick, Regal, etc. Complete outfit with brass lock open pedal, \$1.50. Lincoln Machine Shop, Lincoln, Ill.

DEALERS,

It will pay you to get on our mailing list. We save you money on everything. Write for prices on any special needs.

The Barrier-Sawin Co.,
State Life Bldg.,
Indianapolis, Ind.

DRAGON REPAIR PARTS.

We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

ELECTRIC HORNS, \$2.90; BUMPERS, \$3.00. Write for our bargain sheet. Fred Allen Automobile Supply Co., 1610 S. Michigan Ave., Chicago, Ill.

"FOOL PROOF."

Try the Atwater Kent system of ignition. Always works and will pay for itself in gasoline saved. Their price, \$50.00. We have 80 sets and will sell at \$18.00 each. Ask for bargain sheet. Puritan Machine Co., Detroit.

FORD FAN BELTS, WOVEN COTTON AND silk; outlasts six regular belts. Postpaid, 60c. Dealers, write. Angier's, Streator, Ill.

FORD LIGHTING OUTFITS \$5.50. Includes parabolic reflectors, tungsten bulbs, wiring switch and free delivery. Truscott Auto Supply Co., St. Joseph, Mich.

FORD OWNERS AND DEALERS!

You will save trouble and money by installing our timer elevating device. Ford Parts Specialty Co., 1211 Main St., Richmond, Ind.

FORD OWNERS—OUR SPARE DEMOUNTABLE wheel cures tire trouble on road. Doctors, attention. Write Angier's, Streator, Ill.

FORD OWNERS—WE CAN MAKE YOUR car the easiest rider made with light or heavy load; no jolts, no jars, no upthrow. Write us. Thomas Auxiliary Spring Co., Canisteo, N. Y.

FORD OWNERS: THE BLACKBURN Autolock Switch offers you Certain-Teed Theft Insurance. Yale key for plug. Price \$5.00. Money-Back Guarantee. At your dealer or Blackburn Specialty Co., 1134 Prospect Ave., Cleveland, Ohio.

FORD, HUPP AND MAXWELL Muffler cut-out, machined ready to attach, including lock open pedal string and cables, \$1.35. Lincoln Machine Shop, Lincoln, Ill. c

FOR SALE.

1 35 H P Northway motor.....\$125.00
Model D 4 Bosch Magneto..... 30.00
B No. 3 Stromberg Carb, new..... 8.00
Auto Salvage Co.,
1436 Wabash Ave., Chicago.

FOR SALE—ONE MILLER STEAM TUBE vulcanizer, 54 in. long; good as new. Blank & Six, Ashland, Ill.

FORD T. OWNERS.
Foot throttle or accelerators, \$1.50. Lincoln Machine Shop, Lincoln, Ill. c

FORE DOORS

AT

CUT PRICES.

To reduce stock we are offering big reductions on all our standard Fore-Doors. Write today and secure a bargain while they last.

Address Dept. A.
Auto Specialty Manufacturing Co.,
Indianapolis, Ind.

GUARANTEED BATTERIES.

6 volt 140 Amperes.....\$16.00
6 volt 80 Amperes..... 13.00
6 volt 60 Amperes..... 10.00

The Ampvo Battery Co.,
1607 Michigan Ave., Chicago, Ill.

GUARANTEED ELECTRIC HORNS, MADE by well-known manufacturer. Regular price \$8. Our price \$5. F. E. Alford, Goshen, Ind.

KEROSENE FOR AUTOMOBILES.

Our new Model B uses successfully half and half mixture lowest grades kerosene and gasoline. Satisfaction guaranteed or money refunded. Greatly increased power; very slow speed or high. Starts easy at zero. Special agents' prices. Dept. B. The Air-Friction Carburetor Co., Dayton, Ohio.

**More Than Satisfied**

"Please change our advertisement to read as per enclosed matter. Run until further notice. We have steadily secured excellent results from our ads in MOTOR AGE and are more than satisfied."

L. D. S.

GUARANTEED RADIATORS

For all cars. The following is our stock list of radiators for the cars mentioned, subject to immediate shipments. Compare our prices with other lists.

Ford Model "T".....\$18.00
Buick 10-32-33-14..... 27.50
Buick F-16-17-19-26-27-28..... 35.00
Buick 38-39..... 42.50
Hudson 20..... 33.00
Chalmers F-40..... 30.00
Lion 40..... 25.00
Warren 40..... 28.50
E-M-F 30..... 30.00
Flanders 20..... 30.00
Brush A-B..... 17.00
Anhut..... 15.00
Northern C..... 32.00
Wayne 30..... 35.00
Special 40 H. P..... 15.00

Terms: One-third cash with order, balance with order.

When ordering state year.

AUTO PARTS MANUFACTURING CO.,
453 Trombly Avenue, Detroit, Mich.

GREAT REMOVAL SALE.

\$300,000.00 STOCK

WILL BE MOVED IN THIRTY DAYS.

HELP US MOVE,

WE WILL PAY YOU FOR IT.

THESE PRICES FOR THIRTY DAYS ONLY:

Acetylene headlights, 3 1/2", per pair...\$ 5.00
New brass generators, each..... 1.00
Folding trunk racks, each..... 1.00
Kingston latest carburetor, 1" and 1 1/4", each..... 4.00
Holley carburetors, each..... 4.00
Cementless inner tube patches, per box..... .25
Woven endless belts for Ford cars, each..... .30
Foster shock absorbers, regular price \$45.00 per set, our price per set..... 6.00
Ford crankcase oil gauges, complete, each..... .30
Ford electric lighting outfits..... 4.00
Metzger windshields, plate glass..... 8.00
Electric horns, complete with wire and switch..... 2.85
Melody exhaust horn outfits, complete..... 2.75
Side oil lights, per pair..... 4.50
Dietz electric tail lights, complete with Tungsten bulb and connections..... 1.75
Steel battery or tool boxes for Ford cars, 18x8x6..... 1.75
Ford tool boxes, 21x9x6..... 1.75
Four cylinder Cameron air-cooled new motors, complete with fan and oiling device..... 60.00
Engine spark plug tire pumps..... 8.00
22 H. P. four cylinder water-cooled motors, new..... 100.00
Ford rear end tire holders, complete... 3.00
Brass priming cups, each..... .10
Send for our tire price list of guaranteed tires, which we are selling at cost. Send for our removal sale bargain sheet.

AUTO PARTS CO.,

513-15-17-19-21-23-25-27-29-31 Jackson Blvd.,
CHICAGO.

LAMPS, BLACK AND NICKEL, \$9.50 PER pair, worth \$20.00; bodies, four-passenger, fore-door, untrimmed, \$20.00; Stapley compound foot pumps, \$2.85. Get our bulletin. Automobile Appliance Co., 1712 S. Michigan Ave., Chicago, Ill.

LANDAULET BODY.

For any Straight sill. This body is in A No. 1 condition and will prove a bargain to the first purchaser.

Modern Autop Co.,
607 St. Claire Ave. N. E., Cleveland, Ohio.

LATEST FORD ROADSTER BODY, \$35. Tops, curtains included. MacInnis Bros., Toledo, O.

LION REPAIR PARTS.

We have on hand a complete stock of repair parts for all models of Lion Cars. Lion Motor Parts Co., 124 N. 3rd St., Philadelphia, Pa.

LIST YOUR WANTS OF PARTS, NEW OR second-hand, with Polk Auto Shop, 1006 McInnis Ave., Hattiesburg, Miss.

MACHINE SHOPS AND GARAGES—OUR WELD IT ALL machines will weld perfectly any broken casting that has a melting point. Full particulars on Oxy-Acetylene welding machine sent on receipt of your address. Every machine fully guaranteed. H. D. Prose & Co., Wichita, Kansas.

MR. (FORD) OWNER AND GARAGE MAN.

The Townsman Valve Adjuster has a cushion for your valve-stems. Takes away the click, absolutely silencing the valves. No screws or burrs to work loose. Saves putting in new push-rods and valve-stems. They never wear out. Price \$1.50 by mail. Ask your jobber, or address Townsman Auto Specialty Co., Mitchell, S. D.

MORA REPAIR PARTS.

We purchased the repair business of the Mora Company and have in stock repair parts for all models of Mora cars. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

When Writing to Advertisers, Please Mention Motor Age.

MAGNETOS: WE HAVE 2,000 MODEL X Splitdorf Magnetos, new. Price, without coil, \$17.50 each; with coil, \$25.00 each. The regular price of these is \$75.00.

We also have other makes of magnetos at cut prices, in fact, everything for the automobile. Send for "OUR PRICE WRECKER"—the greatest money-saver in the world.

TIMES SQUARE AUTO CO.,
1210 Michigan Blvd., Chicago, Ill.
S. W. Cor. 56th St. & Broadway, N. Y. City.

NEW FOREDOOR 5-PASS. BODIES, trimmed and painted.....\$75.00
5-pass. metal bodies, unfinished..... 10.00
Splitdorf spark plugs, per four..... 1.60
Stamwood steel running boards, 9 1/2"x48" 1.00
Martindale & Millikan, Franklin, Ind.

ONE MODEL 121 SPECIAL BOWSER GAS Wheel Tank for sale.
North Iowa Motor Sales Co.,
Mason City, Iowa.

OUR AD IN THE CLEARING HOUSE section will interest every live wire salesman. Just turn to page 105 and look it over, we know it will interest you. Look for the name QUICK-KNICK.
Forest City Sales Co., Fremont, Nebr.

OXY-ACETYLENE WELDING AND CUT- ting Machine. The Admiral Welding Machine is built by men who know; large capacity; self-generating; portable; perfect for all classes of work. Send for booklet, "Welding and Cutting." Price, with Welding and Cutting Torches, all Filler Rods, Fluxes, Chemicals, etc., ready to begin earning big money, \$250.

We do expert welding; prices right.
Admiral Welding Machine Co.,
1331 Walnut St., Kansas City, Mo.

POLK AUTO SHOP, 1006 MCINNIS AVE., Hattiesburg, Miss., can sell your second-hand parts. List them.

RADIATORS

To order for all cars.
We use copper fins and tubes.
You can buy brass cheaper, but the cooling efficiency is not there.

Black enamel, baked finish, \$2.00 extra.
Terms cash with order, or one-third deposit with C. O. D. shipments.
\$5.00 Trade Allowance for old radiator shipped in F. O. B. Detroit.

Ford Model T.....	\$22.00
Ford Model R. S. & N.....	28.00
Hupmobile 1910-1911.....	28.00
Hupmobile 1912-13.....	38.00
Warren 1910-1911-1912.....	35.00
Packards to sample, \$50 to.....	65.00
E. M. F. 30.....	35.00
Flanders 20.....	30.00
Patterson 30.....	35.00
Buick 10-14-32-33.....	30.00
Buick 16-17-19-26-27-28.....	35.00
Hudson 20.....	32.00
Hudson 33.....	40.00
Cadillac 30.....	35.00
Paige 1910-1911.....	28.00
Paige 1912.....	30.00

SPECIALS.

One pair Solar eclipse headlights.....	35.00
Gabriel horns, 1, 2 and 3 tubes, \$5, \$7.50, 10.00	
Lion 40 Racing roadster model.....	700.00
Bullet electric lamps, per pair.....	10.00
Prest-O-Lite tank, small.....	9.00
Prest-O-Lite tank, large.....	12.00
Leather runningboard trunks, with two suitcases to fit, bargain.....	15.00
17-inch rubber covered steering wheel.....	2.00
Nonpareil horn bulbs.....	.35
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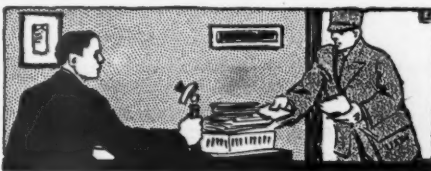
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Ship in any quantity C. O. D. or S. D. B. L.	
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WANTED — A POSITION AS PRIVATE chauffeur. Good references. State make of car and wages. Would prefer Iowa, Minnesota or Wisconsin. Address Box D 439, c/o Motor Age. p

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WANTED—A COMPETENT MANAGER for a thriving wholesale and retail automobile business in an Iowa town of 25,000 inhabitants. Address, giving references, Box D 483, c/o Motor Age. h

WANTED—NEAT APPEARING AUTO ME- chanics, with good references, in all small towns to make installations of automobile devices for us. Address Halliwell Co., 408 West Pico St., Los Angeles, Calif.

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All standard makes at the following prices:

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I do not carry any but standard make tires or deal in inferior brands. I will ship any size tire listed above to any part of the U. S. upon receipt of 10% of order, balance C. O. D.

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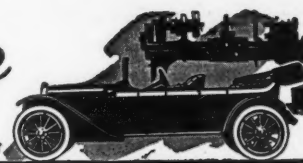




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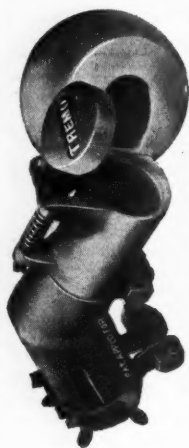
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ECONOMY IN
GOOD
BALL BEARINGS**

Quality

Ball Bearings count less in the cost and more in the durability of a car than anything else in its equipment. Quality and service always win in this essential feature of an automobile.

The merit of R. I. V. Ball Bearings is well indicated by the fact that they are now used by the manufacturers, dealers and motorists who have had the most experience.

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Since 1904

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Special FORGING Steel

by

**Cross Rolled (United) Process
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A forging is no better than the material from which it is made. Our product is low in phosphorous and sulphur.

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1914

Herreshoff

**Electric Self Cranking
Electrically Lighted**

Four Forward Speed Transmission

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Herreshoff models contain many points of progressive refinement, detail, and equipment found in no other car of its class.

For 1914, Herreshoff Cars will still retain their well earned position of being at least two years in advance of the average car of this type. Those who know the market best, who are most closely in touch with the successes of different car manufacturers, concede this position to the Herreshoff without question. If you are not aware of the fact, investigation will verify it. When you know the Herreshoff record and study Herreshoff construction you will concede it too.

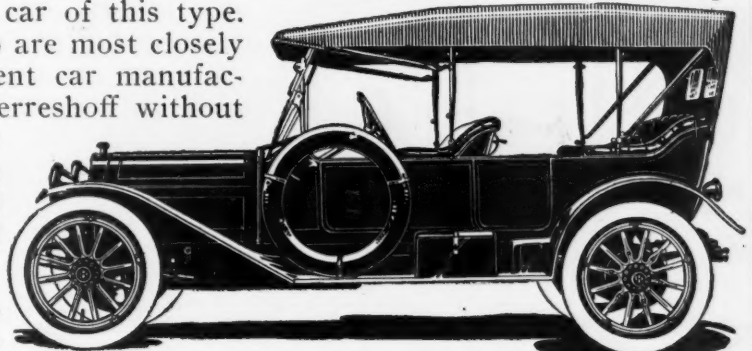
The Herreshoff Six was the first real "Light Six" on the market. It is the forerunner of a type destined to become wonderfully popular. This model was brought out a year ago, after a full year of testing and refinement. Others announced cars of similar type at the same time but it is significant that the Herreshoff was the only true "Light Six" to be produced.

The Six-40 now bears the refinements of a full season's general use. It is better than ever. The motor efficiency is greatly increased. It will run 15 to 18 miles to the gallon of gasoline, compared with 5 to 10 miles per gallon for any other Six.

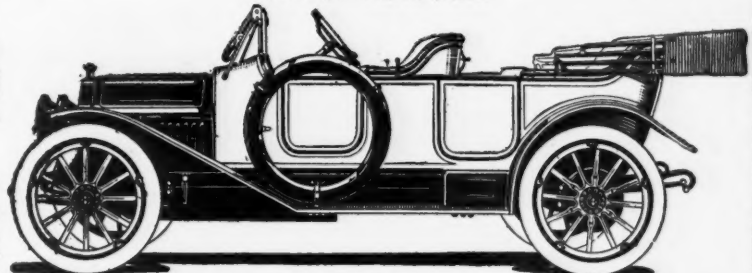
This Six is twelve hundred pounds less in weight than the next lightest six. It is the first car selling under \$2500, fully equipped with electric starter, lighting system, etc., to have a Four-Speed Transmission. No detail has been neglected. Those who have owned the highest priced cars can drive a Herreshoff Six-40 with complete satisfaction.

Herreshoff construction has created a standard of its own. The simplicity of motor and axles, the perfection of materials and workmanship, elimination of needless weight without sacrificing strength, the low initial outlay and upkeep expense—these points have created an ideal which is not met by any other car.

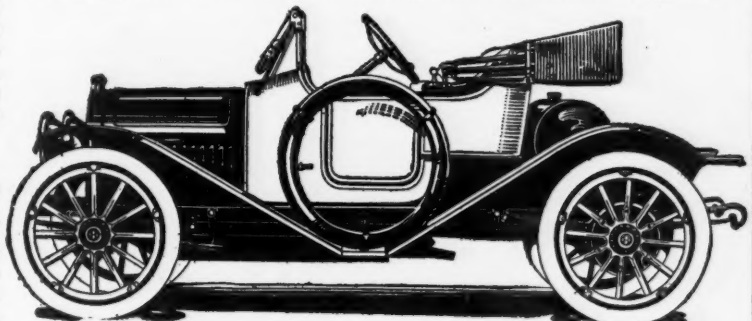
Herreshoff was the first American maker to use a small bore, long stroke motor—and the bore has remained the same since the first. In 1910 a Herreshoff won the National Championship. Its racing record on the Grand Circuit that year made history, winning more firsts than any other two makes of cars. In 1912 it won the famous Algonquin Hill Climb, establishing the world's record for cars of its class. And never in either race or hill-climb has a Herreshoff been beaten by any car in its class.



Herreshoff Six-40. A roomy, comfortable, easy riding car that shows how perfect a Light Six can be built. Long Stroke T-head motor, 3 Point Suspension, 4 Speed Transmission. Left-hand Drive. Right-hand Control. 124" Wheelbase. Platform Springs. Herreshoff-Westinghouse Electric Starter, Lighting and Ignition. Completely equipped. Two, \$1,850 four, five or six passengers. Seven passengers, \$1,900.



Herreshoff 4-30. Long stroke L-head block motor with enclosed valves. Similar in construction to Six-40 and using many parts interchangeable with the Six. 110" Wheelbase. 4 Speed Transmission. Herreshoff-Westinghouse Electric Starter, Lighting and Ignition. Completely equipped. \$1,350



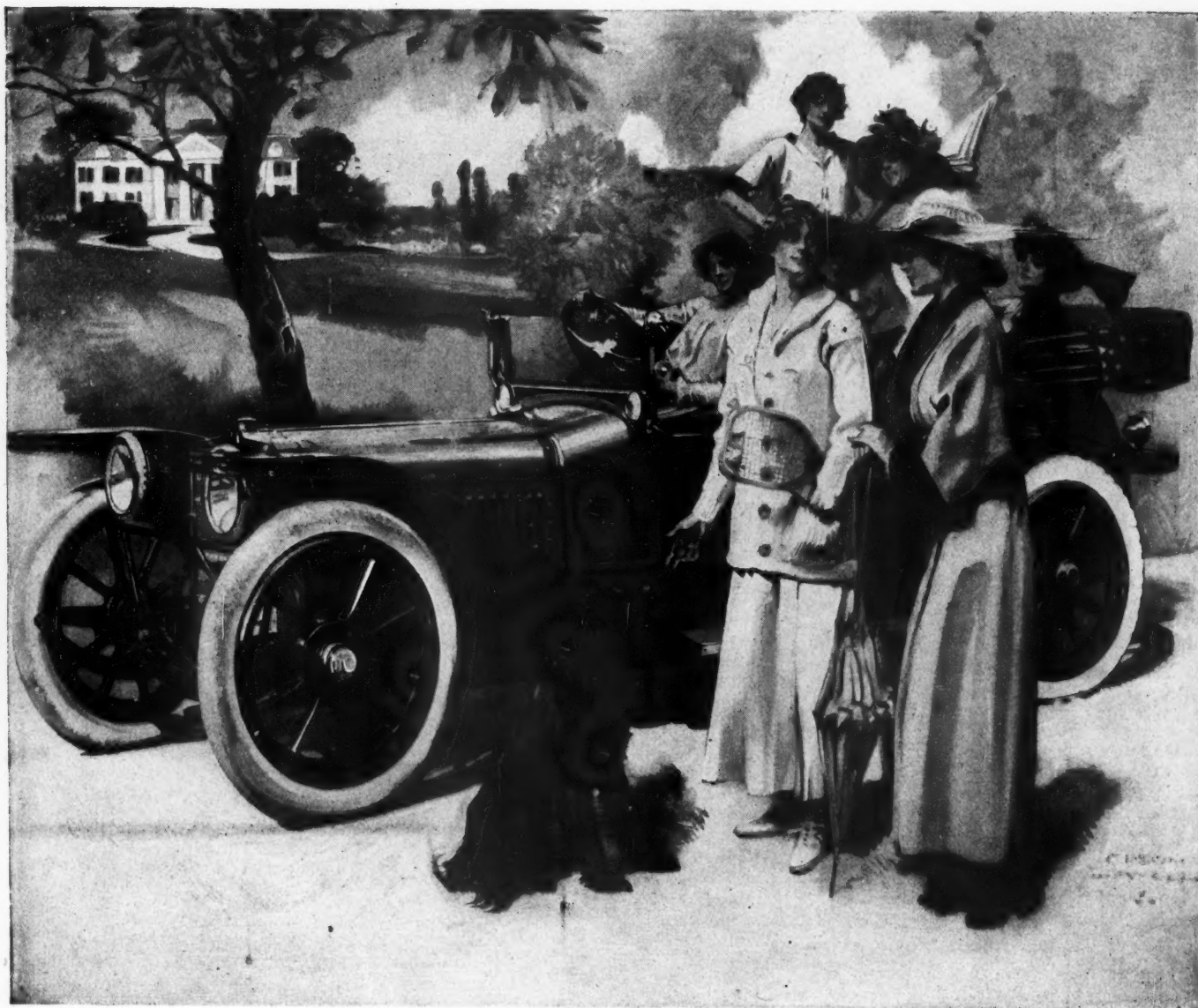
This Herreshoff 4-30 Roadster is an ideal 2 passenger car. It typifies the Herreshoff slogan "Winners by Land and Sea"—the idea of being a little better than anything with which it has to compete. Specifications of this model similar to the 4-30 Touring Car. \$1,250

Wide-awake dealers are requested to write or wire for sales plan and territory

HERRESHOFF MOTOR COMPANY,

Detroit, Mich.

AMERICAN UNDERSLUNG



THE American Underslung design provides for a powerful straight-line drive. This means the minimum power waste, less oil and less gasoline. And the big tires effect additional saving.

Never before in any "Six" have dealers been given such a quick selling combination of beauty, comfort and economy.

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Six cylinders, 75 h. p., six
passengers, electrically lighted
and started. Price \$4500

TYPE 644
Six cylinders, 60 h. p., four
passengers, electrically lighted,
electrically started. Price \$2750

TYPE 422
Four cylinders, 32 h. p., two
passengers, electrically lighted,
self-starting. Price \$1550

**American Motors Company, 424 South Illinois Street
Indianapolis, Indiana**